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The purpose of this study was to determine the mechanism by which monetary incentives influence goal choice, goal commitment, and task performance. It was hypothesized that monetary incentives influence cognitions that determine these events. One hundred and thirty subjects recruited for a work simulation study were assigned randomly to groups that differed in terms of the magnitude of incentive offered for various levels of performance. Overall the results suggest that the effects of monetary incentives on goals and performance may be explained, in part, by their influence on the process of goal choice. Goal choice and commitment were positively related to performance. Also, goals mediated the effects of incentives on performance. A research model is proposed for use in predicting performance.

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FOREWORD

This project was conducted in support of exploratory development task area RF63-521-804-018 (Improving Individual and Unit Productivity).

This report is one in a series concerned with the design of performance-based incentive systems. It describes the basic mechanisms of goal choice, an important determinant of how incentives will affect performance. The results of the study are intended for use by researchers in government, academia, and private industry concerned with understanding the relationships between incentives, goals, motivation, and job performance.

The comments and criticisms of Drs. B. Gutek and R. Keith on an earlier version of this report are gratefully acknowledged.

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SUMMARY

Problem

Organizations providing maintenance, repair, and supply services must become more efficient if they are to support a 600-ship Navy without major increases in their operating costs. Management techniques and organizational structures that improve worker performance are critical in meeting this challenge.

Innovative techniques such as performance-based wage incentive plans are now being tested in the field and are improving worker efficiency in segments of the Navy industrial community by as much as 10-30 percent. Although these successes are encouraging, we still need to learn more about how to maximize the value of these approaches.

An important area of research concerns goal setting and monetary incentives, two prominent management techniques used to improve performance. While they are both recognized as powerful determinants of work motivation and output, there is little understanding of the interrelationships between goal setting, incentives, motivation, and performance due, in part, to the fact that there has been little integration of goal setting with other motivational theories. Moreover, the role of monetary incentives in improving motivation and performance has not been adequately researched and is poorly understood. Still unanswered is the question of the extent to which goal setting may mediate the effects of monetary incentives on performance. Because they are not usually applied together to motivate the same group of workers, there is limited understanding about how monetary incentives can influence goal setting and how they might affect work output when combined.

Purpose

The purpose of this research was to study the relationships between goal setting and monetary incentives and to determine how monetary incentives influence goal choice and task performance and how the basic processes of goal choice might mediate the effects of monetary incentives on task performance. We also wanted to determine if monetary incentives and goal setting together increased work motivation and performance more than either technique alone.

Method

A work simulation study was selected as the method of investigation. Subjects were recruited for part-time employment to perform a clerical transfer task. One hundred and thirty subjects were assigned randomly to one of seven groups that differed in terms of the magnitude of incentive offered for various levels of performance. They worked 5 days, 4 hours a day, for a total of 20 hours at a rate of $4.40 per hour. Research questionnaires were administered 3 times: after assignment to a group, at the start of the third day, and at the start of the fifth day. The quantity and quality of performance were recorded daily.

A research model was designed to provide a useful starting point for investigating relationships between goal setting and monetary incentives.

Results

Overall the results suggest that the effects of monetary incentives on goals and performance may be explained, in part, by their influence on the process of goal choice. First, incentives were found to influence the expectation that alternative performance levels were associated with particular levels of pay (pay instrumentality) and thereby an individual's anticipated satisfaction with performance at a given level (performance valence) and the attraction associated with performing at that level (attractiveness of performance). Second, the cognitive components of goal choice, as specified in the research model, predicted self-set goals and performance, suggesting that the process of goal choice may be linked to expectancy theory. Third, difficulty level of the goal choice and goal commitment were positively related to performance. Fourth, goals appeared to mediate the effects of incentives on performance.

Conclusions

The findings suggest that the process of goal choice and commitment is central to understanding how incentives influence goals, motivation, and performance. The research model proved to be useful in investigating the relationships between organizational context and employee cognitions and for integrating goal setting with expectancy theory.

This study has practical implications. With some tasks, such as clerical, monetary incentives and goal setting jointly used can lead to improvements in work motivation and performance that are superior to those achieved using either technique alone. Furthermore, monetary incentives can be used to effect the setting of more difficult goals and increasing goal commitment. These findings also clarify the relationships between incentives, goals, and performance. Through incentives, people view difficult goals as more instrumental in the attainment of desirable outcomes than easy goals.

Recommendations

This research has contributed to the work motivation and performance technology base and has implications for improving the level of work performance at Navy organizations, particularly shore support activities. There is a need to identify the mechanisms for successfully implementing this technology. Work should be directed toward determining the best way for Navy organizations to:

1. Make the available outcomes explicit and, to the extent possible, reflect them in the recruiting and selection process. This will help ensure that people who are attracted to and selected for employment already understand and value the outcomes offered for alternative levels of performance.

2. Design and communicate to employees the contingencies between performance and job outcomes. This can be done by those responsible for administering the reward system. Implementing programs that use both goal setting and monetary incentives may strengthen the contingencies between high performance and valued job outcomes.

3. Strengthen the perceived probability that high levels of effort will lead to high performance. Training, pep talks, and the use of high performing role models work to increase this perception. Since past experience is an important determinant of the effort-performance expectancy, feedback is critical. Also, reducing perceived situational (e.g., machine downtime) or personal (e.g., lack of ability or confidence) constraints on performance should enhance this expectancy.

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INTRODUCTION

Problem

Organizational systems providing maintenance, repair, and supply services must become more efficient if they are to support a 600-ship Navy without major increases in their operating costs. Management techniques and organizational structures that improve worker performance are critical in meeting this challenge.

Innovative techniques such as performance-based wage incentive plans are now being tested in the field and are improving worker efficiency in segments of the Navy industrial community by as much as 10-30 percent. Although these successes are encouraging, we still need to learn more about how to maximize the value of these approaches.

An important area of research concerns goal setting and monetary incentives, two prominent management techniques used to improve performance. While they are both recognized as powerful determinants of work motivation and output, there is little understanding of the relationships between goal setting, incentives, motivation, and performance due, in part, to the fact that there has been little integration of goal setting with other motivational theories. Moreover, the role of monetary incentives in improving motivation and performance has not been adequately researched and is poorly understood (Lawler, 1981; Opsahl & Dunnette, 1966). Still unanswered is the question of the extent to which goal setting may mediate the effects of monetary incentives on performance. Because goal setting and monetary incentives are not usually applied together to motivate the same group of workers, there is limited understanding about how monetary incentives can influence goal setting and how they might affect work output when combined.

Background

Organizational literature suggests productivity can be improved through a number of different approaches, one of the more popular of which is to increase worker motivation (Greiner, Hatry, Koss, Millar, & Woodward, 1981). Techniques to improve motivation include autonomous work groups, job restructuring, participative management, and monetary incentive systems. Each has merit under certain circumstances (Cummings & Molloy, 1977; Katzell & Guzzo, 1983).

Another motivational technique is goal setting. Researchers compared four methods of motivating employee performance and found strong support for the effectiveness of goal setting (Locke, Feren, McCaleb, Shaw, & Denny, 1980). They reported in field studies that used goal setting that the median performance improved approximately 16 percent. It has been suggested that goal setting is not only more effective than other techniques, but may be the major mechanism by which they affect motivation (Latham & Locke, 1979). The extent to which goal setting mediates the effects of techniques, such as monetary incentives, on motivation and performance is a question of both theoretical and practical interest.

Goal setting is based on the assumption that goals are immediate regulators of human action. Locke (1968) argues that people set personal goals for various activities and that these goals guide their action. Goals and action will lack perfect correspondence, however, since people may make errors, lack ability to meet objectives, or have subconscious conflicts that subvert conscious goals (Locke, Shaw, Saari, & Latham, 1981). A definition of the goal setting concepts cited in this review can be found in Appendix A.

Figure 1 summarizes the principal variables associated with goal setting (Locke et al., 1981). Goals differ in content and intensity and are thought to influence motivation which, in turn, affects task performance. Considerable study has been done of the effects on performance of goals that differ in their levels of difficulty and specificity, although little research has been directed toward understanding the effects of either complex or conflicting goals. Goal intensity has received little systematic study.

GOALS	MOTIVATION	PERFORMANCE

Content
 	
  Difficulty
  Specificity
  Complexity*
  Conflict*
 	
Intensity*
 	
  Scope of Cognitive Process
  Effort Required
  Importance of Goal
  Context of Goal Setting
	Direction
	
	Effort
	
	Persistence
	
	Strategy*
		Quantity
		
		Quality
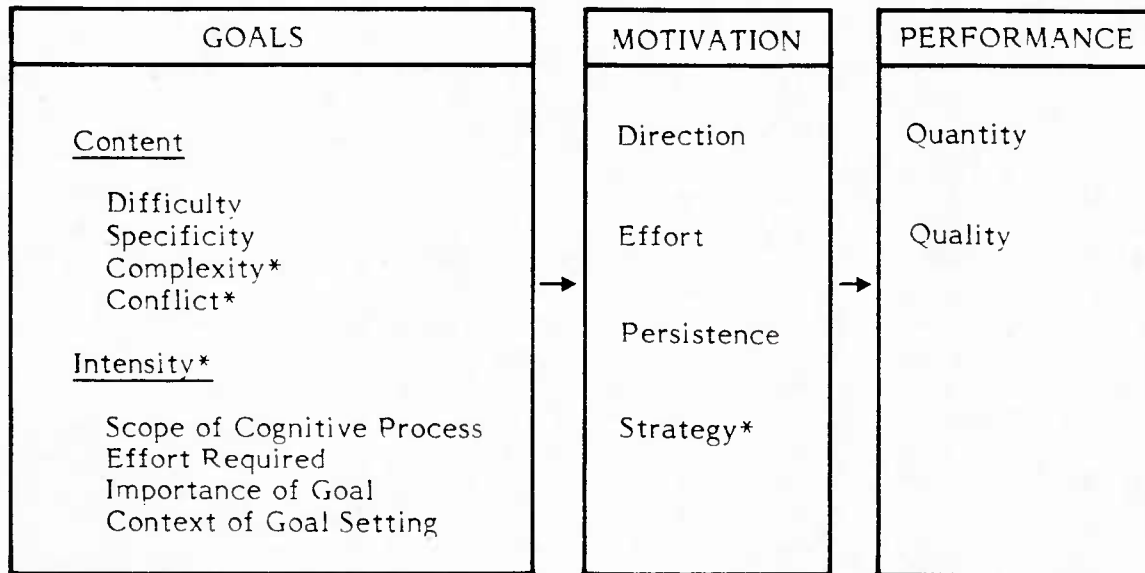
*Little research in these areas.

Figure 1. Principal variables cited by researchers investigating the dynamics of goal setting.

While motivation is a multidimensional concept, most goal setting researchers have defined motivation in terms of the effort dimension. That is, motivation has been viewed as the conscious direction of energy a person expends to achieve a particular goal. Changes in performance become an index of changes in effort and most often have been operationalized in terms of the quantity or quality of task performance.

Five mechanisms (feedback, participation, monetary rewards, individual differences, and goal commitment) are presumed to influence the effects of goals on performance. For example, participation of subordinates with the superior in setting goals appears to result in higher goals being set and a greater degree of goal acceptance and commitment (Latham & Saari, 1979).

A considerable body of research literature on goal setting has developed over the past 15 years. Many studies have found support for the hypothesized effects of goal setting, as summarized in Figure 1. In a review of goal setting research, Locke et al. (1981) state: "The beneficial effect of goal setting on task performance is one of the most robust and replicable findings in the psychological literature."

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Laboratory and field research has provided strong support for the positive effects of goal setting; however, a major weakness of this research is the failure to specify the process by which goals are self-set. With few exceptions, there has been little research directed toward understanding the determinants of goal choice, acceptance, and commitment (Steers & Porter, 1979). Some investigators have used an expectancy theory model to explain goal choice and acceptance. In both laboratory and field settings, goal acceptance has been reliably predicted using expectancy and valence measures (Dachler & Mobley, 1973; Mento, Cartledge, & Locke, 1980; Steers, 1975). These studies tie in with the "level of aspiration" studies where expectations of success and the value placed on the outcomes of goal attainment were found to be the principal determinants of "level of aspiration" (Frank, 1941; Hilgard, 1942/1958). These two factors relate closely to the core concepts in expectancy theory: expectancy and valence (Vroom, 1964).

In addition to a limited understanding of how people set goals, we lack clear evidence about the role of monetary incentives in goal setting. We know that monetary incentives can motivate performance in industrial settings (Marriott, 1971; Whyte, 1955). A recent review of research on different approaches to improving worker productivity found wage incentive plans to be more effective than goal setting, participation, or job enrichment (Locke et al., 1980).

Locke (1968) argued that goal setting may be one mechanism by which monetary incentives affect task performance. He hypothesized that incentive pay could affect the level at which goals are set by the employee. Results from five experiments conducted by Locke, Byran, and Kendall (1968) supported this idea. They found that goals affected performance even when the effects of incentives were partialed out, whereas incentives were unrelated to the performance when goal level was partialed out. A number of studies, however, have failed to corroborate these findings (Chung & Vickery, 1976; Latham, Mitchell & Dossett, 1978; London & Oldham, 1976; Pritchard & Curts, 1973; Terborg, 1976; Terborg & Miller, 1978). Results of these studies suggest that incentives and goal setting may have independent effects on performance.

Some theorists have suggested that monetary incentives are likely to increase goal acceptance and commitment, but will not necessarily induce a person to set a harder goal (Steers & Porter, 1979). In terms of expectancy theory, monetary incentives should endow goal success with a higher valence or value than that resulting from no incentive (Locke et al., 1981).

Results from studies conducted to test this hypothesis have been contradictory and inconclusive. The failure of these studies may lie in poor experimental designs, inadequate measures, and imperfect introspection by subjects. More specifically, attempts to measure goal commitment have been deficient (Latham et al., 1978; Pritchard & Curts, 1973), incentive amounts have been insufficient (Locke et al., 1968), and populations sampled have been limited (Rosswork, 1977). For a detailed discussion of these deficiencies and possible solutions, see Locke et al. (1981).

In summary, goal setting has been found to be a powerful technique for influencing work motivation and task performance. A major weakness of goal setting theory is its failure to specify the determinants of goal choice. Therefore, this approach provides little understanding of the process by which people set goals. Moreover, the relationship between monetary incentives and goal setting, two prominent techniques used to influence

motivation, is poorly understood. It may be that the effects of monetary incentives on goal setting lie in their influence on the process of goal choice. The need to research these issues is evident.

Purpose

The primary purpose of this research is to explore the ways in which monetary incentives influence goal choice, goal commitment, and task performance. It is hypothesized that goal difficulty and commitment will mediate the effect of monetary incentives on performance. An hypothesized path model reflecting these expectations is presented in Figure 2. The model suggests that monetary incentives directly influence goal difficulty and commitment and that these three goal setting variables are non-causally related to each other. Difficult goals are expected to result in higher performance than less difficult goals, and high commitment to a goal is expected to lead to closer conformity to the goal than low commitment.
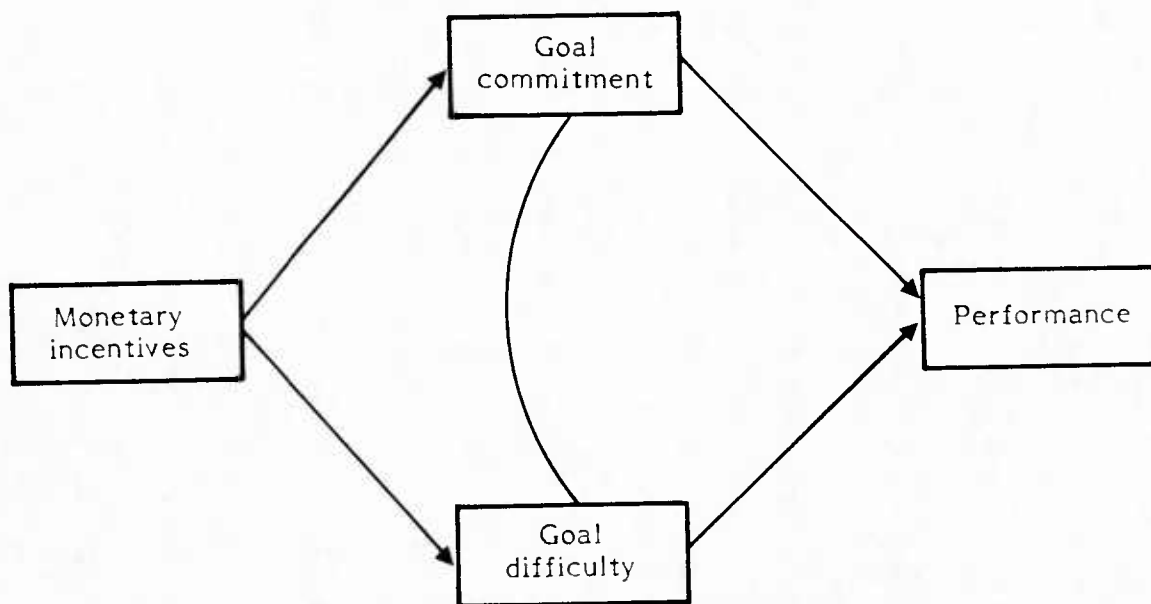
Figure 2.   Hypothesized path model showing the influence of mone-
tary incentives on goal difficulty, goal commitment, and
performance.

While the path model in Figure 2 may help to clarify the relationships between incentives, goal difficulty, goal commitment, and task performance at a macro level, it does not suggest the mechanism through which incentives influence these variables. The model does not specify how people choose goals and how these goals relate to work motivation and performance. Since the explanation for how incentives work may be in their influence on the determinants of these events, a model which specifies a within-person process is needed. Such a model is depicted in Figure 3 and it will be used to guide the present research. A partial test of the model will be performed to determine its usefulness in explaining performance.
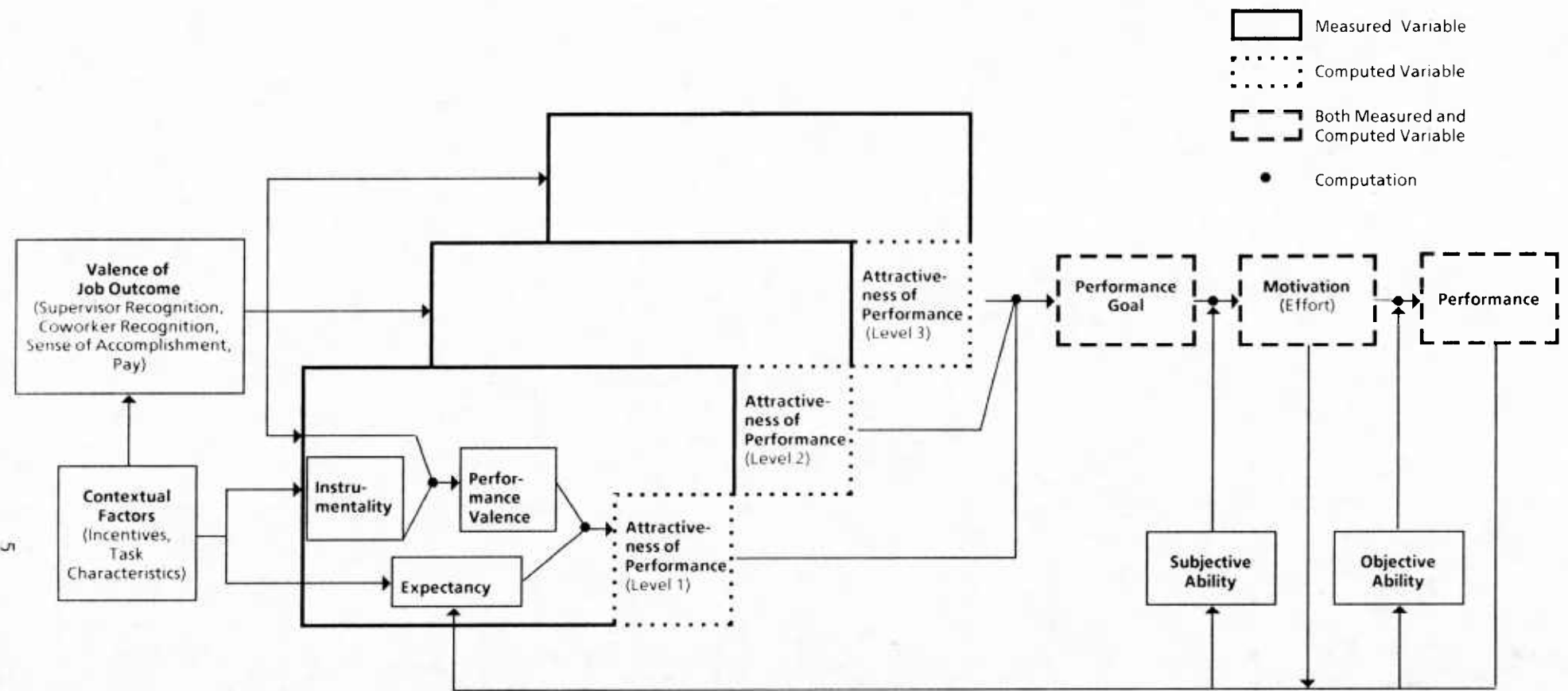
Note. The variables in parentheses indicate the ways the model was operationalized for this study.

Figure 3. A model showing the relationship of incentives to goal choice, work motivation, and task performance.

Work Motivation Model

Expectancy theory concepts and processes were used in the model to understand how people set goals. The model explains work motivation and performance as a cognitive process through which an individual chooses from alternative performance goal levels that level perceived to be most attractive. This perception of attractiveness is based on beliefs and feelings a person has regarding the likelihood that performing at certain levels will lead to particular job outcomes. Contextual factors, such as the opportunity to earn monetary incentives for good performance, will influence these beliefs and feelings. We hypothesized that the performance goal will influence the amount of effort a person is willing to expend in accomplishing the goal. Furthermore, an individual's self-assessment of ability as well as actual ability are presumed to influence the relationships between goals, motivation, and performance.

Since in this model the goal concept is a major determinant of effort and performance, it is crucial to understand how people choose their goals. Not only do the determinants of goal choice need to be identified, but the process by which goals influence motivation and performance needs to be articulated.

The model suggests that contextual factors influence <u>valence</u> (an individual's antici-pated satisfaction with obtaining particular levels of different job outcomes) and <u>instrumentality</u> (the expectancy that different performance levels will be associated with different outcomes). Contextual factors also affect <u>expectancy</u> or the belief of people concerning the likelihood of achieving particular levels of performance if they try their best. Valence and instrumentality combine multiplicatively to determine performance valence. <u>Performance valence</u> is a hypothetical construct that represents the anticipated satisfaction of performing at a given level of performance, satisfaction derived from the degree of association of that level with particular job outcomes and the valence of those job outcomes. Performance valence combines multiplicatively with expectancy to produce a perception of attractiveness associated with each performance level. This construct is called <u>attractiveness of performance</u>. In essence, each possible level of task performance acquires valence through its association with certain job outcomes and the anticipated satisfaction associated with those outcomes. This performance valence is then modified by a person's belief concerning the likelihood of achieving that level of performance given his or her best effort (expectancy). The result is a perception of attractiveness for each level of performance.

The model specifies that goal choice is based on a person's evaluation of the relative attractiveness of various performance levels. The model is flexible in that it accommo-dates different assumptions about how people actually choose their goals. Three assumptions are described here. (1) If the assumption is made that people try to maximize gains, an assumption common in the expectancy theory literature (cf. Dachler & Mobley, 1973), then the model predicts that the performance level having the highest perceived attractiveness will be chosen as the performance goal. (2) Alternatively, some evidence supports what Herrnstein (1974) calls the "matching law." Herrnstein hypothesizes that the frequency of a response at some level of performance is proportional to the value of reinforcement at that level. The model predicts, then, that goal choice is in reality the weighted average of attractiveness of performance across performance levels. (3) Finally, if the assumption is made that people use an incremental decision rule in choosing a goal, such as a return-on-effort strategy, then the model predicts goal choice to be some measure reflecting the marginal gain in the attractiveness of performance for a particular level. This approach has been successfully employed to improve expectancy theory predictions of performance (Kopelman, 1977). Other choice rules are possible, but

for simplicity they will not be treated here. While logical arguments can be found in support of these three assumptions, their accuracy as representations of the goal choice process is unknown since empirical evidence is lacking.

The intensity or commitment to a chosen goal can be predicted using the attractiveness-of-performance construct in the model. This construct is analogous to the concept of subjective expected utility (SEU), which is the cross-product of the likelihood of receiving a particular outcome and its value (Edwards, 1961). Associated with each level of performance, therefore, is an individual's SEU. People who sharply distinguish between various levels of performance in terms of expected value (high SEU) are hypothesized to have a higher level of commitment to their personal goals than those who do not make these distinctions. This hypothesis integrates parts of decision theory with Lewinian theory concerning level of aspiration (Siegel, 1957). This approach suggests that people will be more committed to goals that correspond to performance levels where SEU is substantially greater than SEUs for alternative performance levels.

The remainder of the model describes the process by which performance goals are translated into work motivation and the work motivation into task performance. The hypothetical relationship of these concepts and the process by which goals are translated into performance is based on the theoretical position that performance (P) equals the product of ability (A) and motivation (M) ($P = A \times M$). For present purposes, motivation will be represented by the hypothetical construct "effort."

The model suggests that effort is the result of goal choice and a self-assessment of ability (i.e., subjective ability). Based on an assessment of their own abilities, individuals will adjust the amount of effort they will expend in accomplishing their goals. For example, if the self-assessment of ability is low relative to the performance goal, then intended effort will be increased in order to perform at the desired level. Correspondingly, if the self-assessment of ability is higher than the performance goal, then intended effort will be decreased since it exceeds the amount of effort perceived to be required to perform at the desired level. Operationally, the model defines the relationship between performance goal (PG), subjective ability (SA), and effort (EFF) to be $EFF = PG/SA$, which is equivalent to $M = P/A$ and is algebraically derived from $P = A \times M$.

The final link in the model concerns the relationship between effort, objective ability (OA), and performance. Performance is the result of effort moderated by objective ability. For example, high effort should lead to high performance if an individual has sufficient ability to perform at the desired performance goal level. If ability is lacking, however, the level of actual performance will be lower than the level of the performance goal. Operationally, the model defines the relationship among these variables as $P = OA \times EFF$.

Though cognitions serve telic purposes, they are influenced by past behavior and experience. The model includes feedback loops that suggest that a person's expectancy is influenced by past expenditures of effort and performance. Also, past performance affects both a person's objective ability and subjective estimate of that ability. These factors, in turn, affect future effort and performance. The model is dynamic--the source of purposive action is cognitive activity that is influenced consciously or unconsciously by past action and its consequences.

<u>Research Questions</u>

The central question of the study pertains to the way that monetary incentives influence dimensions of goal choice, goal commitment, and task performance. We hypothesize that the explanation for how incentives affect these variables lies in the influence of incentives on the determinants of goal choice and goal commitment, specifically valence, instrumentality, and expectancy. Monetary incentives may increase the anticipated satisfaction people associate with monetary rewards as well as strengthen the expectancy between different performance levels and different outcomes. Either of these effects will increase the performance valence levels and consequently the attractiveness-of-performance levels. This may lead to any or all of the following: increased propensity to set goals, selection of more difficult goals, selection of more specific goals, and increased goal acceptance or goal commitment. We hypothesize that any of these will lead to either higher task performance and/or greater conformity to the goal choice. Incentives are hypothesized to influence goal commitment by strengthening instrumentality and thereby increasing the difference between the SEUs that people attach to alternative performance levels. The model suggests that high commitment to a goal occurs when the SEU for that goal is considerably higher than the SEU associated with other performance goal levels. The expectation is that goals for which commitment is high will be achieved more often than goals for which commitment is low.

A number of specific research questions follow:

1.   How well do the expectancy concepts and processes in the research model explain goal choice, goal commitment, and task performance?

2.   What effect does goal choice (i.e., specificity, difficulty, and commitment) have on task performance?

3.   What effect do monetary incentives have on goal specificity, difficulty, and commitment, and the propensity to set a goal?

4.   Do goal choice and goal commitment mediate the effect of monetary incentives on task performance?

METHOD

<u>Subjects</u>

One hundred and thirty subjects participated in this study. Their average age was 21 years. Seventy-one of the subjects were female and 59 were male. Approximately 40 percent were high school students and the remaining 60 percent were undergraduate college students. Some data for six subjects were missing and therefore were unavailable for some of the analyses.

<u>Task</u>

The subjects worked on a clerical task, transferring data from handwritten questionnaires onto mark-sense forms. The performance standard for the task was 5.75 questionnaires per hour, a standard established using industrial engineering methods described by Barnes (1980).

Conditions and Procedure

A work simulation study was selected as the method of investigation since this approach combines the realism of the field with the control found in a laboratory setting.

Subjects were recruited through school newspaper advertisements and job postings for part-time summer employment with a university foundation. To qualify for the job, each subject had to attain a score of 23 or better on the clerical aptitude portion of the Short Employment Test (SET) (Bennett & Gelink, 1978) and had to provide a work sample after training but prior to assignment to groups. Those who qualified for the job were assigned randomly to one of seven groups, two control and five experimental. A description of the various treatment conditions is given in Table 1. Subjects were told that they would be working on a job contracted between the university foundation and the United States Navy and that the contract allowed Navy researchers to ask for their assistance in conducting some research about the conditions of their job. Each subject worked 5 days, 4 hours a day, for a total of 20 hours at a rate of $4.40 per hour. For a description of the method for determining wages and incentive pay, see Table 2. Subjects worked in rooms resembling offices; the rooms were quiet, air-conditioned, and well-lighted. Each subject was provided with a work station having a table and chair. A break area was available where subjects could socialize and consume refreshments without disturbing others who were working. At the end of the last work day the purposes of the research were explained and consent to use individual subject data was obtained. A detailed description of the daily work schedule and the task instructions given by the supervisors to the subjects can be found in Appendix B.

Research questionnaires were administered three times: after assignment to a group, at the start of the third day, and at the start of the fifth day. Although these questionnaires differed somewhat at each administration, each contained common expectancy and goal items. Data analyses pertaining to the research questions of this study are confined to the questionnaire and performance data from the third day. This day was selected over the first or fifth days because there were more observations of performance for each subject on this day. Also, on the first day there was less work time due to the training and orientation, and on the fifth day some of the work was spent explaining the purposes of the study. A copy of the research questionnaire can be found in Appendix C.

Constructs and Measures

In this section each of the theoretical constructs in the study is defined and the measures used to operationalize these constructs are specified. The goal, effort, and performance constructs were operationalized independent of the model for purposes of validating the model predictions.

Objective Ability

In this study, ability is defined as the individual's natural talent or acquired proficiency for performing the clerical transfer task. Two measures of clerical ability were obtained. The first was the individual's score on the Short Employment Test (SET) published by the Psychological Corporation (Bennett & Gelink, 1978). The SET includes a clerical aptitude test that was administered as a selection device. This test was used because of its relevance to the task employed in this simulation. Second, a work sample was given to obtain a maximum performance score. This was done after the subjects were trained in the task but prior to assignment to groups. To motivate the subjects, they were told that the work sample performance score would be used to decide whether or not they

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Table 1

Treatment Conditions

Control conditions		Experimental conditions				
1[a]	2[b]	3[c]	4	5	6	7
No work standard	Work standard	Work standard	Work standard	Work standard	Work standard	Work standard
No incentive	No incentive	Incentive	Incentive	Incentive	Incentive	Incentive
		SR^d = 25%	SR = 50%	SR = 75%	SR = 100%	SR = 125%

[a]Condition 1: Subjects were asked to perform the task during their work shift. There was no work standard or opportunity to earn an incentive.

[b]Condition 2: Subjects were asked to perform the task during their work shift. They were informed of the work standard and told that the standard reflected the expected performance for an average person working at a normal work pace under normal working conditions. No positive or negative consequences were associated with performance above or below the standard.

[c]Conditions 3-7: In the experimental conditions, subjects were told that if their work performance exceeded the standard, they would be able to earn incentive pay. The magnitude of the incentive depended upon the level of performance and the sharing rate (i.e., 25%, 50%, 75%, 100%, 125%). See Table 2 for an explanation of method for computing wage and incentive payments.

[d]Sharing Rate = SR: This refers to the proportion of the hourly pay rate paid to a subject for production in excess of the work standard.

Table 2

Method of Wage and Incentive Payment

Definition of Terms

Hourly Pay Rate (HPR) - The amount of money paid to a subject for each hour of work . (i.e., $4.40 per hour).

Production Rate (PR) - The number of work units completed each work shift that have acceptable quality.

Standard Rate (STD) - The number of work units per hour required to meet the work standard each shift. This number is based on an hourly work standard of 5.75 units. This standard was developed using a time study method. The number of units for the daily shift standard equals the number of work hours in the shift multiplied by 5.75 units.

Performance Efficiency (PE) - This performance index equals the PR divided by the STD.

Expended Hours (EXH) - The number of hours in a shift.

Earned Hours (ERH) - This value is the product of PE and EXH.

Incentive Hours (IH) - This value is equal to the ERH minus the EXH. Negative values will equal zero to prevent penalizing subjects for work performance below the standard on previous shifts.

Sharing Rate (SR) - Refers to the proportion of the HPR paid to the subject for each IH. For example, with an SR of 50 percent, a subject earning $4.40 per hour will receive $2.20 for each IH he or she earns.

Incentive Pay (IP) - The amount of incentive payment.

Calculation of Wages

Conditions 1 and 2. Wages for subjects in these conditions will equal:

$$Wages = EXH \times HPR$$

Conditions 3-7. Wages for subjects in these conditions will equal:

$$Wages = (EXH \times HPR) + IP,$$

where: $IP = IH \times SR \times HPR$, or

Incentive pay = (Incentive Hours) (Sharing Rate) (Hourly Pay Rate)

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would be retained for the job. The rationale for this deception was that if all subjects were highly motivated, then differences in the work sample performance scores could be interpreted as differences in ability. This rationale is based on the assumption that $P = A \times M$. The errors made by a subject on the test were subtracted from the total responses so that the score reflected only correct responses. This was done to hold quality level constant across subjects.

These two ability measures were compared in terms of their capacity to predict performance using a multiple regression analysis. Not only did the work sample explain more of the performance variance than the SET among the subjects, most of the variance accounted for by the SET was redundant to that accounted for by the work sample. In view of this result, the work sample score was used as the ability measure in this study.

Subjective Ability

Subjective ability is an individual's perception of his or her ability to perform a task. Subjective ability was measured by asking subjects to estimate their production rate if they worked at their fastest pace.

Valence of Job Outcomes

Valence of job outcomes refers to an individual's anticipated satisfaction with different levels of certain job outcomes. The measure of valence was obtained for four job outcome classes: pay, coworker approval, feelings of accomplishment, and supervisory recognition. Each outcome class consisted of several levels (e.g., different amounts of pay) and each level was rated by the subjects as to its attractiveness on a 21-point scale ranging from -10 through 0 to +10. This measure was developed and validated by Ilgen, Nebeker, and Pritchard (1981).

Instrumentality

Instrumentality refers to an individual's expectation that alternative performance levels are associated with different job outcomes. The instrumentality measure asks respondents to indicate which level of each outcome is most likely to occur following a given level of performance. This measure has been found to produce predictions of performance with accuracy comparable to conventional instrumentality measures (Ilgen, Pritchard, Bigby, and Nebeker, 1982). The advantage of this particular measure over others is that it is considerably shorter and easier for the respondent to answer.

Expectancy

Expectancy represents a person's belief concerning the likelihood of achieving a particular level of performance at a given level of effort. Expectancy was measured by asking subjects to identify their expected performance level if they were to work at their fastest pace. For performance at or below this level, the expectancy probability assigned was 1.0. This suggests that a person expending maximum effort has a 1.0 probability of attaining any level of performance equal to or less than his or her maximum performance. Correspondingly, the expectancy for higher performance levels was set at zero, since these levels were viewed as unattainable. In instances where subjects estimated their maximum performance to be between the midpoints of alternative performance levels used on the questionnaire, a proportional interpolation procedure was used. For example, if a person reported that maximum performance would be 5.5 questionnaires per hour,

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then an 0.5 probability was assigned as the expectancy at the 6-per-hour performance level and 1.0 for all levels of 5 and below.

This approach to computing the effort-performance expectancy was derived from the research model that suggests that people choose a performance goal from a set of attainable alternatives. The expectancy serves as a cognitive screen so that unattainable performance levels are not considered in the goal choice. Since the expectancy serves simply to distinguish performance levels seen as attainable from those seen as unattainable, there is no need to calculate the full matrix of expectancy probabilities that would be required to make an expectancy theory prediction of effort.

The model suggests that a person's decision concerning expenditure of effort follows goal choice in time. The degree of effort a person will expend is a function of the goals a person chooses and the person's subjective estimate of ability relative to the goal. The mechanisms of the model can be illustrated by the following example. Suppose a person were offered a monetary reward to pick up a box and move it. That person may set a goal to do so if he or she believes that the goal is attainable and values the reward. The choice of how much effort to expend in picking up the box will be influenced, in part, by the person's self-assessment of strength relative to the weight of the box. Based on feedback from previous experience performing such tasks, a person may adjust the effort as necessary to achieve the goal. If one believed the box to be full of rocks but in reality it was empty, the effort level initially used would be much greater than necessary to achieve the goal. Immediately upon sensing the box to be empty, the person would quickly adjust effort downward so that only that needed to pick up the box would be used.

Performance Valence

Performance valence is a hypothetical construct representing an individual's anticipated satisfaction with performing at a given level of performance, satisfaction derived from its association with a particular job outcome and valence of that outcome. Performance valence was computed by taking the product of valence and instrumentality. Because multiple levels of performance and outcomes were used in the measurement of these constructs, it was necessary to employ a matrix method to combine them (Hollenback, 1979). The equation used to determine performance valence was:

$$PV_i = (\Sigma\ I_{ijk}\ V_{jk}).$$

Attractiveness of Performance

Attractiveness of performance is a hypothetical construct representing the expected value a person associates with a given level of performance. This construct was operationalized by multiplying expectancy and performance valence. Attractiveness of performance equals performance valence for levels of performance where the expectancy is 1.0, that is, levels a person believes are attainable. Attractiveness of performance equals zero for performance levels where the expectancy is zero because a person believes these levels of performance are unattainable.

Performance Goal

In this study, performance goals were self-set by an individual. While three types of performance goals were assessed in the questionnaire (production goals, error rate goals, and effort goals), only responses to items pertaining to the production goals were

considered. Since goal setting studies typically compare the effects of goals varying in their levels of specificity and difficulty, goals were measured in these regards.

In most goal setting research, the experimenter controls the type and range of goals that can be set. In these studies the goals are either assigned or set participatively. Since the focus of this study was on self-set goals, the respondent was given the freedom to choose from a wide range of goals. This made the measurement of goal specificity and difficulty somewhat more complex and possibly less precise than that of most other goal setting studies. However, by concentrating on self-set goals, we were able to reduce the demand characteristics of the experimental situation on the subject's goal choice and thereby improve the likelihood of observing the effects of incentives on goal choice and commitment.

The production goal was measured on the questionnaire by asking people to select from a list of goal statements the option that best reflected their personal production goal. The options included a single quantitative goal (e.g., eight questionnaires per hour); a range of performance levels (e.g., between seven and nine questionnaires per hour); or nonquantitative goal statements (e.g., "do as many as I can"; "be as fast as the average worker"). The respondents could also write their own goal statements if none of the options were appropriate. Goal specificity was determined by the subject's choice of options. Three levels of specificity were used. The most specific goals were single value quantitative goals; moderately specific goals were quantitative performance ranges; nonquantitative goals (goal statements) were the least specific.

The goal difficulty for subjects selecting a quantitative goal was determined by statistically controlling the subject's ability measure to ensure that the goal difficulty measure reflected the extent to which the goal level approached the individual's maximum performance. This procedure for deriving a measure of goal difficulty is different from the approach taken in many other goal setting studies where the difficulty of a goal is determined by comparing goal levels and randomly assigning subjects of different ability levels to different goal levels. The problem with using the traditional approach for self-set goals is that it is unclear whether ability or goal difficulty accounts for differences in performance. When ability is statistically controlled, however, the effect of the goal difficulty on performance can be determined with greater precision.

Predictions of production goal level and difficulty were also derived from the research model based on three choice strategies: return-on-effort, maximization, and value-matching. The return-on-effort rule yielded a goal prediction corresponding to the performance level that showed the largest increase in attractiveness over the previous level. The maximization rule produced a goal prediction corresponding to the performance level with the highest attractiveness-of-performance score. The value-matching rule yielded a goal prediction based on the average of the performance levels weighted by their respective attractiveness-of-performance scores. Consistent with the procedure employed with self-set quantitative goals, the predicted goal levels were controlled statistically by a subject's ability measure.

Propensity to Set a Goal

Propensity to set a goal, or the extent to which people consider setting performance goals, was measured in this study. Previous research suggests that the use of performance incentives may induce a greater propensity to set goals. Subjects were asked to rate, on a 5-point scale, the extent to which they had thought of setting a production goal.

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Goal Commitment

Definition. For this study, goal commitment refers to the degree of energy (determination and tenacity) that a person is willing to expend to achieve a goal. Goal commitment is high when an individual is highly motivated and determined to meet the goal.

Two types of goal commitment measures were obtained. First, a self-report measure (CMT) made up of several items was employed. This measure was similar to others found in goal setting studies (e.g., Latham et al., 1978; Pritchard & Curts, 1973). Second, four measures were developed based on a combination of a subject's valence, instrumentality, and expectancy responses. In accordance with the model, the combination of these variables yields a distribution of scores for each subject reflecting an individual's attraction to each level of performance. It was hypothesized that people would be more committed to goals when the level of attractiveness of performance for the chosen goal was substantially higher than those for alternative goal levels. This idea integrates parts of decision theory with Lewinian theory concerning level of aspiration (Siegel, 1957).

Method of Calculation. To capture the shape of the distribution of expected values for different performance levels, four measures were calculated. Although each of the measures reflected kurtosis to some degree, each had a distinguishing feature. The Commitment 1 (CMT 1) measure reflected the average absolute deviation of the attractiveness-of-performance scores from the highest score of these values. The Commitment 2 (CMT 2) measure was the same as the first except that the calculation only included performance levels seen as attainable by the subject. The Commitment 3 (CMT 3) measure was calculated by taking the differences between the highest and lowest attractiveness-of-performance scores. The Commitment 4 (CMT 4) measure was the same as the third except that the difference score was multiplied by the highest attractiveness-of-performance score. This step was included in order to weight the absolute height of the distribution in the calculation of the measure.

Performance

Performance was measured by the amount of task accomplishment. Two performance dimensions were measured. First, quantity was measured using an efficiency index of production (i.e., number of units produced per hour). Quality was measured by an index of error rate (i.e., average number of errors per unit).

Motivation

Generally, work motivation is considered a multidimensional concept (see Figure 1). For this study, the effort dimension was the theoretical construct for motivation (M). Effort refers to the direction of energy to achieve a particular goal. Effort was measured by dividing actual task performance by objective ability ($M = P/OA$). This is derived from the $P = A \times M$ equation that presents performance as a multiplicative function of ability and motivation (Vroom, 1964).

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RESULTS

Manipulation Check

Incentive Pay and Performance

It was expected that subjects in the groups earning incentive pay would perform better than subjects in the nonincentive groups. To test this hypothesis, an analysis of variance was performed with treatment condition as the independent variable and performance as the dependent variable.

The results of this analysis suggested a significant treatment effect, $F(6, 120) = 3.27$, $p < .005$. A planned comparison of the performance means for the incentive and nonincentive groups revealed a significant difference, $t(120) = 3.87$, $p < .001$. As expected, subjects in the incentive groups performed significantly better than those in the nonincentive groups.

Incentives and Instrumentality

Based on responses to the pay instrumentality items, the experimental treatment of groups 3-7 was very effective. For all groups, the reported pay instrumentalities approximated the actual relationships between pay and performance. Expected levels of pay varied as a function of both level of performance and treatment condition. This interaction between experimental condition and performance level was evaluated with a mixed design analysis of variance. Results of this analysis indicated a significant interaction, $F = (30, 570) = 61.17$, $p < .001$, as was expected. It should be noted that the performance levels calling for a production rate of 3, 4, and 5 units per hour were excluded from the analysis. The reason was that there were no hypothesized differences among groups at these levels. Incentives could not be earned by subjects in performance below the 5.75 standard, regardless of treatment condition.

Reliability and Stability of Measures

Where possible, reliability and test-retest stability coefficients for each of the measures were calculated. These results are presented as the diagonal entries in Table 3, a correlation matrix for the variables of central interest in this study. The only measure where an internal consistency reliability could be calculated was for self-report goal commitment (CMT). This analysis revealed that a four-item scale is superior (coefficient alpha = .73) to a five-item scale. For performance, goal difficulty, and other commitment measures, the coefficients were based on the scores obtained by the same subject on each variable on the third and fifth days. Results revealed that the stability coefficients for the measures derived from the expectancy theory measures ranged from .35 to .72, while the self-report goal level and task performance coefficients were .61 and .85 respectively. The measures derived from the research model were somewhat less stable than were the self-report measure of goal level and actual task performance.

Expectancy Theory Concepts and Goal Setting Variables

The first research question pertained to the capacity of the model to account for the process of goal choice, goal commitment, and task performance. To evaluate the model, three goal choice measures, each based on different choice strategies (return-on-effort (ROE), maximization (M), and value-matching (VM)), were compared in terms of their predictions of self-reported goal choice and performance. Measures of goal commitment

Table 3

Pearson Correlation Coefficients for Key Variables

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Performance	(.85)														
2	Work sample	.48*	−													
3	Subjective ability	.55*	.42*	−												
4	Goal level (ROE)	.54*	.40*	.82*	(.58)											
5	Goal level (VM)	.33*	.19*	.49*	.48*	(.72)										
6	Goal level (M)	.49*	.31*	.87*	.76*	.43*	(.64)									
7	Goal level (self-report)	.55*	.28*	.82*	.81*	.58*	.80*	(.61)								
8	Goal specificity	.11	.07	.21*	.21*	.01	.20*	.05	−							
9	CMT	.34*	.19*	.34*	.26*	.22*	.36*	.44*	.03	−						
10	CMT 1	.30*	.17*	.54*	.41*	.16*	.57*	.39*	.23*	.34*	(.61)					
11	CMT 2	.30*	.16*	.56*	.44*	.31*	.58*	.42*	.19*	.35*	.96*	(.62)				
12	CMT 3	.29*	.18*	.59*	.43*	.47*	.59*	.45*	.16*	.38*	.90*	.94*	(.66)			
13	CMT 4	.09	.08	.03	-.01	.15*	-.03*	.00	.07	.21*	.44*	.44*	.51*	(.35)		
14	Effort	.22*	.23*	.05	.06	-.03	.09	.17	-.10	.25*	.18*	.15	.14	.03	−	
15	Incentive	.33*	.02	.24*	.33*	.20*	.29*	.45*	.12	.21*	.18	.19*	.16*	.00	.06	−
	Number of Cases	124	124	124	123	123	123	65	124	124	123	123	123	121	123	124
	Mean	6.18	175.68	7.08	6.50	7.24	6.95	6.70	1.73	15.97	12.06	714.90	23.10	7.31	76.87	.71
	Standard Deviation	1.84	35.14	1.34	1.42	.31	1.49	1.39	.78	2.44	8.90	574.05	14.78	4.61	13.88	.46

Note. Reliability coefficients were computed where possible and are shown in parentheses.

*p < .05.

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based on the research model and a self-report were compared to determine the one most predictive of performance, controlling for goal difficulty. Finally, the ability of the model to predict performance was evaluated by correlating the predicted performance with actual task performance. The results of these analyses are summarized below for goal choice, goal commitment, and performance.

Goal Choice

Prior to evaluating the goal choice measures, we examined responses to the self-report goal choice question. Twenty-six subjects selected a single numerical quantitative goal, 39 selected as a quantitative goal a numerical range, and 60 set nonquantitative goals. To increase the sample size for the single quantitative goal category, goals for subjects with quantitative range goals were computed by averaging the upper and lower anchors of the range chosen. This resulted in 65 subjects with a single quantitative production goal.

The three goal choice measures, derived by combining constructs in the research model, were compared to determine the one most highly related to self-reported quantitative goals and performance. This comparison was made as a partial test of the validity of the goal choice process specified in the research model and to select the measure of goal choice most predictive of performance. The three measures were based on different decision rules: ROE, M, and VM. Each rule required a different algorithm for combining levels of the attractiveness-of-performance construct. Correlations between the three measures, self-reported goal choice, and performance are found in Table 4.

Table 4

**Correlations Between Goal Choice Measures and Performance
For Subjects with a Single Quantitative Goal ($\underline{n}$ = 65)**

		ROE	M	VM	SR
1.	Return on effort (ROE)				
2.	Maximization (M)	.81			
3.	Value-matching (VM)	.54	.50		
4.	Self-report	.81	.80	.58	
5.	Performance	.50	.44	.32	.55

Note. All correlations are significant ($\underline{p}$ < .01).

The goal choice measure based on the ROE algorithm is more highly related to performance ($\underline{r}$ = .50) than the measures based on the M ($\underline{r}$ = .44) or VM ($\underline{r}$ = .32) alternatives. While each of these correlations is statistically significant ($\underline{p}$ < .01), they are not significantly different from one another. A test of the difference between two correlation coefficients for correlated samples yielded a non-significant $\underline{t}$ statistic for

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each pair of correlations (Ferguson, 1966, pp. 188-189). It can be seen in Table 4 that the self-report goal was significantly correlated to performance (r = .55, p < .01). Also, the self-report goal was correlated significantly with the ROE, M, and VM goal choice predictions (r = .81, .80, and .58 respectively). A test of the difference between two correlation coefficients for correlated samples yielded a significant t statistic (t = 3.37 (65), p < .05) between the ROE and M predictions and the VM predictions. While the three model measures did not differ significantly in terms of their correlation with task performance, the ROE measure related most highly to performance; its relationship to self-reported goal choice is comparable to the M alternative and significantly higher than the VM alternative.

It was of interest to determine if the relationship between the ROE goal measure and performance would hold up for subjects without quantitative goals. For the entire sample, the correlation between this goal measure and performance was r = .54 and for people without quantitative goals r = .57, both significant (p < .001). Also, the results of a t test indicated no significant mean difference in performance between those people who set quantitative goals and those people who did not.

It appears that the goal choice measure based on the ROE algorithm relates highly to self-reported goal choice. It also provides a significant prediction of performance, regardless of whether or not a subject set a quantitative goal. In view of these findings, the ROE measure of goal choice will be used in subsequent analyses.

Goal Commitment

Four measures of goal commitment derived from the research model and the self-report scale were compared to determine the measure most predictive of performance. It was reasoned that the relative validity of these measures could be inferred from the strength of the obtained relationships. Each of the four model measures combined the expected value for each level of the attractiveness-of-performance construct using a slightly different algorithm. These algorithms were designed to produce a measure capturing the shape of this distribution of expected values. While most of the measures reflected the kurtosis of the distribution, each had a unique feature. For example, one measure included the absolute height of the distribution in its formulation, while others only expressed the shape of the curve. In these analyses, goal difficulty was controlled because it was related to goal commitment and performance and because it was of interest to us to observe the relationship between goal commitment and performance independent of goal difficulty.

The zero-order correlations between the goal commitment measures and performance are presented in Table 3. Three of the four model predictions of commitment were significantly related to performance, as was the self-report measure. The three significant model predictors and the self-report measure of goal commitment were entered stepwise into a multiple regression equation after goal difficulty (i.e., objective ability and goal level) to predict performance for subjects who set a quantitative goal (n = 65). Of the commitment measures, the self-report measure entered the equation first and was the only commitment measure to effect a significant increment in the R^2 (F = 4.35, p < .05). For the entire equation of goal difficulty and self-reported goal commitment, the multiple R was R = .70, F = 19.32, p < .001. A similar result was obtained when this analysis was replicated with the entire sample (N = 122), substituting the derived measure of goal level for the self-report measure. It was reasoned that a similar result could be interpreted as support for the validity of the research model. For the entire equation of

goal difficulty and self-reported goal commitment, the multiple R was $R = .64$, $F = 27.69$, $p < .001$. These analyses suggest that the self-report measure of goal commitment has superior validity to the comparison measures. Subsequent analyses of goal commitment, therefore, used the self-report measure.

Performance

The capacity of the model to predict performance was evaluated by correlating the predicted performance with actual task performance. The model prediction of performance was significantly correlated with actual performance on the task ($r = .46$, $p < .001$). While this prediction was slightly better for subjects who set quantitative goals ($r = .55$, $p < .001$) than subjects who did not ($r = .39$, $p < .001$), the difference between these correlations was not significant. These findings provide provisional support for the validity of the research model in predicting performance.

Summary

The capacity of the research model to account for goal choice, goal commitment, and task performance was evaluated. Three goal choice measures, each based on different choice strategies, were compared in terms of their predictions of self-reported goals and performance. Results suggest that the goal choice measure based on the ROE strategy is the preferred measure because it relates highly to self-reported goal choice and also provides a significant prediction of performance. Thus, the ROE measure of goal choice will be used in subsequent analyses. Measures of goal commitment derived from the model and the self-report were compared to determine the one most predictive of performance, controlling for goal difficulty. Results of this analysis suggest that the self-report measure of goal commitment has superior validity to the goal choice measures. Also, it was found that the performance score predicted by the model was significantly related to actual task performance.

Goals and Performance

The second research question pertained to the relationship of goal choice (goal difficulty and specificity) and goal commitment to performance. It was hypothesized that: (1) subjects with difficult goals would perform better on tasks than those with less difficult goals; (2) subjects with specific goals would perform better on tasks than those with nonspecific goals, and (3) high commitment to goals would lead to higher performance than would low commitment. These hypotheses were tested using a hierarchical multiple regression analysis so that the relative contribution of each independent variable in predicting performance could be ascertained. The ability measure was entered into the equation first as a covariate to ensure that the effects for goal level could be interpreted as an effect for goal difficulty. Further, removing the effect of ability permitted a more accurate assessment of the goal commitment and specificity effects on performance.

The results of the multiple regression analysis are summarized in Table 5. The overall equation was significant ($R = .64$, $F = 20.59$, $p < .001$). The addition of goal level resulted in a significant increase in the R ($F = 28.69$, $p < .001$); the same was true for the addition of goal commitment ($F = 6.74$, $p < .05$). Examination of the betas showed that goal specificity was the only predictor that did not account for a significant portion of the variance in performance. These findings support the hypotheses that goal difficulty and commitment are positively related to performance. The hypothesis that specific goals are more highly related to high performance than nonspecific goals was not supported by these data.

Table 5

Summary of Multiple Regression Analysis: Goal Variables Predicting Performance ($\underline{N} = 122$)

Predictor	Simple $\underline{r}$	Beta	Multiple $\underline{R}$	$\underline{R}^2$	$\underline{R}^2$ Change	$\underline{F}$ Change
Objective ability	.48**	.29**	.48**	.23	.23	35.93**
Goal level	.54**	.40**	.61**	.38	.15	28.69**
Goal commitment	.35**	.19*	.64**	.41	.03	6.74*
Goal specificity	.10	.00	.64**	.41	.00	0.00

*$\underline{p}$ < .05.

**$\underline{p}$ < .001.

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Incentives and Goals

The third research question pertained to the effect of monetary incentives on goal difficulty, specificity, and commitment, and on the propensity to set a goal. The expectation was that monetary incentives would positively affect these goal setting variables. That is, incentives would encourage people to set more difficult and specific goals and also express greater commitment to these goals. It also was anticipated that incentives would increase a person's propensity to set a goal. To test these hypotheses, t tests were performed comparing the incentive and nonincentive groups on each of these goal setting variables. Results showed that goal difficulty, goal commitment, and propensity to set a performance goal were significantly higher for the incentive groups than the nonincentive groups. The test for the significance of the mean differences yielded t = 4.31 (121), p < .001 for goal difficulty, t = 2.38 (122), p < .01 for goal commitment, and t = 2.92 (121), p < .05 for propensity to set a performance goal. A significant mean difference was not found between the groups in terms of goal specificity. These findings suggest that the treatment had a significant effect on increasing goal difficulty, commitment, and propensity for setting goals, but not on goal specificity.

Incentives, Goals, and Performance

The fourth research question pertained to using goal setting constructs to interpret the relationship between monetary incentives and performance. It was hypothesized that both goal difficulty and commitment would account for the effect of monetary incentives on performance; that is, the effects of monetary incentives on performance would result from their effects on goal difficulty and commitment (Figure 2). For this study it was assumed that these two variables are noncausally related.

A test of the path model provided partial support for the hypothesized relationships (Figure 4). The zero-order correlation between incentive condition and performance (r = .32, p < .001) suggests that people who can earn incentives will perform better than people who cannot. Examination of the path coefficients revealed that this relationship can be partially interpreted by the fact that people in the incentive groups tended to set more difficult goals and express more commitment to their production goals than people in the control groups. This analysis also suggested, however, that monetary incentives had a significant direct effect on task performance independent of their influence on goal difficulty and commitment. All path coefficients are statistically significant (p < .05). The effects of objective ability were statistically controlled so that goal level could be properly interpreted as goal difficulty and so that potential confounding of ability and the incentive manipulation could be removed.
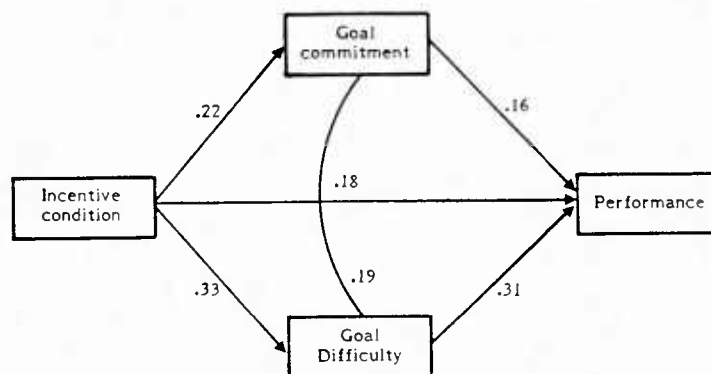

Figure 4. Path model showing the influence of monetary incentives on goal setting and performance.

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DISCUSSION

The central purpose of this study was to determine the mechanism by which monetary incentives influence goal choice, goal commitment, and task performance. It was hypothesized that incentives would affect goals and performance through their influence on the determinants of these events. Overall the results suggest that the effects of monetary incentives on goals and performance may be explained, in part, by their influence on the process of goal choice. First, monetary incentives influenced pay instrumentality. Second, the cognitive components of goal choice, as specified in the research model, predicted self-reported goals and performance, suggesting that the process of goal choice may be linked to expectancy theory concepts and processes. Third, difficulty level of the goal and goal commitment were positively related to performance. Fourth, the goals mediated the effects of incentives on performance.

The effect of incentives on pay instrumentality indicates that (1) the treatment affects individual perceptions about the amount of pay associated with alternative levels of performance, and that (2) the pay instrumentalities approximate the actual relationships between pay and performance, indicating that the pay contingencies are perceived accurately. In terms of the research model, the effect of the treatment is to increase instrumentality and thereby increase performance valence, the anticipated satisfaction of performing at a given level of performance. The performance valence for a given performance level is derived from its degree of association with particular job outcomes and the valence of those job outcomes to the individual. It can be concluded that the experimental treatment is very effective in strengthening this association.

The goal choice process specified in the research model is supported by the findings, suggesting that expectancy theory concepts may be useful in understanding the cognitive components of goal choice. The combination of the expectancy constructs produces a reasonably accurate prediction of goal choice. The predicted goal choice, regardless of the decision rule used in its calculation, is significantly correlated with the self-reported goal. This finding suggests that goal choice is a cognitive process whereby an individual chooses from alternative performance goal levels the level perceived to be most attractive. This perception of attractiveness is based on various beliefs and feelings a person has regarding the likelihood that performing at certain levels will lead to particular job outcomes. The results indicate that contextual factors, in this case the opportunity to earn monetary incentives for good performance, influence these beliefs and feelings.

While the findings suggest that the process of goal choice involves the cognitive components specified in the model, results were equivocal with regard to the decision rule that best represents the choice process. All three decision rules yield significant predictions of goal choice, but the strengths of these predictions do not differ significantly from each other. This study was not designed to compare each of these rules in terms of validity. As such, it may be that the distribution of the attractiveness-of-performance values precluded a good comparison (i.e., one outcome would be more likely if a particular rule were true). Such a comparison could be accomplished by experimentally manipulating valence, instrumentality, and expectancy so that the three decision rules would produce significantly different goal predictions from the same set of data.

The expectation that the goal commitment measures derived from the research model would be superior to the traditional self-report measures is not supported. While the simple correlation between performance and four of the five goal commitment measures is significant, none of the derived measures explain significant additional

variance in performance beyond that explained by the self-report measure alone. It may be that the strength of these predictions is attenuated due to unreliability in the derived measures. The stability coefficients for these measures are low, ranging from .35 to .66. The goal commitment measures are based on the distribution of attractiveness of performance, calculated by multiplying valence, instrumentality, and expectancy. Perhaps this procedure for deriving the measures increases the measurement error enough to reduce the reliability of the derived measures and thereby their ability to correlate with other variables.

The results support the hypotheses that incentives induce a person to choose more difficult goals and increase the degree of goal commitment. Also, there is evidence that difficult goals and a high degree of commitment to the goal lead to high performance. Both goal difficulty and self-reported goal commitment correlate significantly with the amount of incentive offered as well as with the level of task performance. The goal difficulty result replicates the well-documented finding that goal difficulty and performance are positively related (Locke et al., 1981). The goal commitment result, however, contradicts the findings reported in a number of previous goal setting studies where goal commitment was not found to be related to performance (Latham et al., 1978; Pritchard & Curts, 1973).

The conclusion that can be drawn based on the self-report goal commitment measure used in this study supports Locke's assertion that one of the functions of an incentive may be to increase a person's commitment to a goal (Locke et al., 1968). In contrast to most previous studies of goal commitment, goals in this study were self-set, not assigned. When people feel free to choose their own goals and have the opportunity to earn incentives for high performance, a wider range of commitment may result than when goals are assigned and incentives are not offered. Consistent with this interpretation are the findings of Locke and Shaw (1982) who found a significant effect of commitment on performance for self-set goals. It may be that most previous studies have failed to find goal commitment effects because goals were assigned, incentive amounts were small, and the studies themselves contained a number of methodological deficiencies (Locke et al., 1981).

Another goal setting variable examined in this study was the propensity to set goals. It has been suggested that one function of incentives might be to increase the likelihood of spontaneous goal setting (Locke et al., 1981). While individuals in the incentive groups reported a significantly greater propensity for setting goals than individuals in the control groups, they did not set more specific goals than subjects in the control groups. These results suggest that incentives induce people to think more about setting a goal as well as setting a more difficult goal, but do not necessarily affect the setting of more specific goals. Results from other studies have been contradictory on this latter point. For example, Saari and Latham (cited in Locke et al., 1981) found that employees set specific goals for themselves when incentives were introduced. In the laboratory, however, incentive pay did not lead to more specific goal setting than did hourly pay (Terborg, 1976; Terborg & Miller, 1978).

The results pertaining to goal specificity were somewhat surprising. Our results suggest that goal specificity may not be related to task performance. The findings from many goal setting studies, however, suggest that goals regulate performance most predictably when they are expressed in quantitative terms rather than as vague intentions to "try hard" (Locke et al., 1981). One possible explanation for this discrepancy may lie in the approach taken in this study to operationalize goal level and specificity. Unlike most goal setting studies, in the present study these two constructs were operationalized

independently. Self-reported quantitative goals were considered specific, whereas "do your best" goals were considered vague. (In most studies "do your best" or "try hard" goals are also considered vague but are assumed to be difficult goals.) Goal level was the numerical value resulting from combining the expectancy constructs for each subject. Thus, each individual had a measure for goal specificity and an independently derived quantitative measure of goal level.

The reason that some studies have found that subjects with specific goals perform better than those with vague "do your best" goals may be that the latter goals could be construed to be either hard or easy, depending on the situation. For example, when a person has had experience on a task where the term "best" conveys particular meaning, then a vague goal may be as good as or better than a specific goal. For example, if my best running time for a mile is five minutes, then I have some idea of what to aim for when I am assigned or when I choose a goal that states to "do your best." However, when someone is learning a new task and has little experience upon which to base a meaning to "do your best," then a specific goal coupled with performance feedback ought to elicit better performance than a vague goal.

Common usage of the phrase "do your best" may also contribute to confusion about its meaning. Parents may tell a child to "just do your best," either in haste or to diminish the anxiety associated with performing a new task where success is uncertain. This usage may lead some individuals to interpret "do your best" as an easy or moderate goal rather than as a difficult goal, as intended by some investigators. Due to the possible ambiguity in the meaning of "do your best" and the fact that many goal setting studies have been conducted in situations where the subjects are not highly practiced in the task or in setting goals, "do your best" goals may be interpreted as easy or moderate. If "do your best" were interpreted by a person to be an easy or moderate goal, difficulty level rather than specificity may account for its relation to performance. That is, in some situations "do your best" goals may be associated with poorer performance because they are seen as easy, not because they are vague.

Other researchers have also questioned the value of goal specificity. For example, Terborg (1976) found that subjects finishing a task in the fastest time expressed some indication of goal setting but did not seem to have specific goals. Similar results have been reported by other investigators (Ivancevich, 1974; Latham & Yukl, 1975; Organ, 1977). Further research is needed to clarify the relationship between goal specificity and performance.

Finally, the results only partially support Locke's assertion that monetary incentives affect performance only if and to the extent that they affect goals (Locke et al., 1968). The conclusion that can be made based on the goal difficulty and commitment measures used in this study suggests that monetary incentives and goals can independently influence performance. This is consistent with the more recent view by Locke and his colleagues (Locke et al., 1981) that incentives and goals can have independent effects upon performance.

There are a number of explanations that may account for the finding that incentives have an effect on performance outside of their effects on goal difficulty and commitment. First, the measurement error associated with the goal level measure used in this study may have been so large as to attenuate the observed relationship between goal level and other variables. Goal level, like the derived measures of goal commitment, was a computed variable based on the product of the three expectancy constructs. The combined measurement error of these variables may have substantially reduced the

reliability of the goal level measure so that its true relationship to other variables was underestimated.

Second, goal setting variables not included in this study may account for a significant portion of the effect of incentives on performance. Perhaps goal conflict should have been measured and included in the present analysis. Goal conflict refers to the degree to which attaining one goal negates or subverts attaining another. In this study, for example, subjects were asked to keep their error rate at or less than 2 percent, although there were no clearly established consequences for deviating from this rate other than supervisor disapproval. This assigned error rate goal and a high performance efficiency goal may be in conflict and it appears that the degree of conflict was influenced by the amount of incentive offered. The results show that people in the higher incentive groups tended to set higher efficiency goals than those in lower incentive groups, even though all subjects had the same assigned error rate goal. If goal conflict is related to magnitude of incentive and performance, the inclusion of goal conflict as a goal setting variable may help to explain additional variance between incentives and performance. Research is needed that addresses the mediating roles of variables such as goal conflict and complexity as well as dimensions of goal intensity (see Figure 1).

Another possibility is that, during the work day, subjects revised the performance goal they reported at the beginning of the day. In most instances people revise their goals or level of aspiration as they gain experience on a task (Lewin, 1936/1958). If subjects did revise their goals as they worked, the reported goal used in the present analyses would not be the actual goal influencing performance. In this case it is likely that the goal measure would underestimate the true relationship between the goal constructs and incentives and performance

Taken as a whole, the results of this research support the hypothesis that the process of goal choice plays an important role in mediating the effects of incentives on performance. Moreover, the research model is consistent with well-documented findings from goal setting literature and is supported by data in this study. This model provides a useful tool to guide research aimed at integrating expectancy theory and goal setting.

Some investigators have used expectancy theory concepts to explain goal acceptance and the effect of setting difficult goals on motivation. The expected value of goal attainment (the product of valence and instrumentality) has been found to increase as goal difficulty increases (Matsui, Okada, & Mizuguchi, 1981). Moreover, to the extent that this increase in the expected value outweighs accompanying decreases in the expectancy of goal attainment, motivation to achieve the goal increases. Some investigators have argued that expectancy concepts mediate the goal difficulty effect on motivation (Meyer, Konar, & Schacht, 1983). They found that when expected value of goal attainment was controlled statistically, the effect of goal difficulty on motivation was greatly reduced. Mento et al. (1980) reported that the probability of accepting assigned goals was affected by the expectancy and valence of success. Taken together, these findings suggest that a better understanding of the relationship between goals, incentives, motivation, and performance will come when researchers begin to focus on the more basic issue of how incentives influence our internal cognitive processes in the choice of a goal. Perhaps expectancy theory concepts, as depicted in the research model for this study, provide just such a beginning.

Before drawing conclusions and making recommendations, certain limitations of the present findings should be noted. First, the data for this study were collected in a simulated work setting and, although every effort was made to make it resemble a real

job, the task and working conditions may differ from what would be found in a long-term employment situation. To the extent this is true, the conditions may have influenced the beliefs, feelings, and performance of the participants. These findings may not be generalizable to more complex tasks performed by people in technical or managerial positions.

Participants in the study were employed for one week. While this is far longer than the time frame for most controlled experiments, the results obtained may be influenced in some way by the length of the experiment. For example, the effects of monetary incentives on goals and performance may change over time. This issue needs to be investigated. Second, the results, based on the derived measure of goal level, must be viewed with caution until the validity of the research model is more fully demonstrated. The test of the model used to derive the goal level and commitment measures was preliminary only, used in this study as a guide for identifying the determinants of goal choice. Additional research is needed to determine the decision rule that should be used in computing the goal choice. Furthermore, as the reliability estimates suggest, the measures used to assess some of the goal constructs are lacking in precision and need refinement. However, most of the results are internally consistent and in agreement with well-documented findings from the goal setting literature.

CONCLUSIONS AND RECOMMENDATIONS

The process of goal choice is central to understanding how incentives influence goals, motivation, and performance. The research model designed to explore this process was shown to have both theoretical and practical value. It provided a useful starting point for integrating goal setting with expectancy theory.

We found that for clerical tasks monetary incentives and goal setting used jointly produced improvements in work motivation and performance superior to those achieved using either technique alone. Furthermore, incentives encouraged subjects to set more difficult goals and to increase goal commitment. These findings also clarified how incentives influence goals and performance. Through incentives, people viewed the attainment of difficult goals as more desirable than the attainment of easy goals.

IMPLICATIONS FOR THE NAVY

This study contributes to the work motivation and performance technology base and has implications for improving the level of work performance at Navy organizations, particularly shore support activities. There is a need to identify the mechanisms for successfully implementing this technology. Work should be directed toward determining the best way for Navy organizations to:

1. Make the available outcomes explicit and, to the extent possible, reflect them in the recruiting and selection process. This will help ensure that people attracted to and selected for employment already understand and value the outcomes offered for alternative levels of performance.

2. Implement programs that use techniques such as goal setting and monetary incentives to raise the level of performance.

3.   Strengthen the perceived probability that high levels of effort will lead to high performance. Training (Bandura, 1982), pep talks, and the presence of high performing role models (Bandura, Adams, & Beyer, 1977) increase this perception.   Since past experience is an important determinant of how a person expects to perform and thus how much energy should be expended to achieve a particular goal, feedback is critical. Also, reducing perceived situational (e.g., lack of material) or personnel (e.g., lack of ability or confidence) constraints on performance should enhance this expectancy.

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APPENDIX A

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Attractiveness of Performance

Attractiveness of performance is a hypothetical construct representing the expected value a person associates with a given level of performance.

Direction

Direction is the dimension of motivation referring to the channel or course of attention and action.

Effort

Effort is the dimension of motivation referring to the conscious direction of energy to achieve a particular goal.

Expectancy

Expectancy represents a person's belief concerning the likelihood of achieving a particular level of performance given a particular expenditure of effort.

Feedback

Feedback refers to the return of evaluative or corrective information to an individual concerning his/her performance on a task. Feedback is often used interchangeably with the term "knowledge of results."

Goal Acceptance

Goal acceptance means that one has agreed to commit oneself to a performance goal assigned or suggested by another person.

Goal Choice

Goal choice refers to the self-set performance goal of an individual.

Goal Commitment

Goal commitment refers to the degree of energy, reflected in the determination or tenacity, that a person is willing to expend in order to achieve a particular performance goal.

Goal Complexity

Goal complexity refers to the number of results aimed for and their interrelations (Locke et al., 1981).

Goal Conflict

Goal conflict refers to the degree to which attaining one goal negates or subverts attaining another (Locke et al., 1981).

Goal Difficulty

Goal difficulty refers to the degree of proficiency or level of performance sought (Locke et al., 1981).

Goal Intensity

Goal intensity pertains to the process of setting a goal or of determining how to reach it. Measures of intensity would include factors such as the scope of the cognitive process, the degree of effort required, the importance of the goal, and the context in which it is set (Locke et al., 1981).

Goal Setting

Goal setting is a technique used to improve work motivation and task performance by having individuals or groups set performance goals.

Goal Specificity

Goal specificity refers to the degree of quantitative precision with which the performance goal or aim is specified (Locke et al., 1981).

Incentive

In this report, the term incentive refers to financial compensation given in return for performance above a work standard.

Individual Differences

Individual differences is a term that refers to variables used to classify or differentiate individuals. Individual difference variables include demographics (e.g., education level, race, job tenure, age, and sex) and personality characteristics (e.g., need for independence, higher order need strength, self-esteem, and locus of control).

Instrumentality

Instrumentality refers to an individual's expectation that alternative performance levels are associated with particular job outcomes.

Motivation

Broadly defined, motivation has to do with a set of independent/dependent variables that explain the direction, amplitude, and persistence of an individual's behavior, holding constant the effects of aptitude, skill, and understanding of the task and the constraints operating in the environment (Campbell & Pritchard, 1976). While motivation is a multidimensional concept, in this study the effort dimension is used as the theoretical construct for motivation.

Objective Ability

Objective ability is an individual's natural talent or acquired proficiency for performing a task.

Participation

Participation refers to the degree to which subordinates have a part or share in setting a performance goal.

Performance Goal

A performance goal is what an individual is trying to accomplish; it is the object or aim of an action.

Performance Valence

Performance valence is a hypothetical construct representing an individual's anticipated satisfaction with performing at a given level of performance, satisfaction derived from its association with a particular job outcome and the valence of that outcome.

Persistence

Persistence is the dimension of motivation referring to directed effort over time.

Productivity

Productivity is defined as the ratio of measured work output to measured resource input. Productivity = work output/resource input.

Strategy

Strategy is the dimension of motivation pertaining to the development of skill or creative problem-solving. The mechanism for developing a strategy is cognitive in nature.

Subjective Ability

Subjective ability is an individual's perception of his or her own ability.

Task

A task is similar in meaning to that of performance goal and refers to a piece of work to be accomplished (Locke et al., 1981).

Task Performance

Task performance is behavior directed toward task accomplishment. While there are different dimensions of task performance such as quantity and quality, in this study task performance refers to quantity (i.e., number of units produced per work shift).

Valence of Job Outcomes

Valence refers to an individual's anticipated satisfaction with different levels of certain job outcomes.

APPENDIX B

WORK SCHEDULE AND TASK INSTRUCTIONS

Work Schedule

Time	Monday	Tuesday	Wednesday	Thursday	Friday
0730(1200)	Roll call orientation	Explanation of report	Questionnaire	Work begins	Questionnaire
0740(1210)	Training				
0748(1218)	Practice	Work begins			
0755(1225)					
0820(1250)	Work sample				
0830(1300)	Incentive Instructions		Work begins		Work begins
0845(1315)	Questionnaire A				
0930(1400)	Work begins				
1100(1530)					Work ends
1130(1600)	Work ends	Work ends	Work ends	Work ends	Debriefing
Work hours planned	2	3.7	3	4	2.5

OUTLINE OF INSTRUCTIONS FOR SUPERVISORS

I.   Introduction

    A.   Your name
    B.   Purpose of job
    C.   Brief description of job
    D.   Roll call
    E.   Housekeeping
        1.   Time cards
        2.   Parking
        3.   Paychecks
        4.   Dismiss selected people
    F.   Employee numbers

II.   Training

    A.   Preparation for "work sample"
    B.   Purpose of "work sample"
    C.   Evaluation criteria (neat, accurate, quick)
    D.   General description of Fleet Experience Questionnaire
    E.   Filling out initial information (side two)
        1.   Identification number
        2.   Question #2 information in "special codes"
        3.   Questions 4-15 in "name" section
    F.   Filling out questions 16-190 (side one and side two)
    G.   Rules
        1.   Sequence of answers
        2.   Errors
        3.   Stray marks and smudges
        4.   Multiple responses
        5.   No response
    H.   Procedures
        1.   Providing questionnaires and answer sheets
        2.   Pencils
        3.   Completed work
        4.   Talking
        5.   Breaks
        6.   Bending answer sheets
    I.   Questions?

III.   Practice: 3 questionnaires passed out to each

    A.   Read questions in booklet
    B.   Practice coding
    C.   Questions?
    D.   Collect answer sheets

IV.   Work sample (10 minutes) and scoring

V. Explanation of incentive system (groups 1-5)

    A. Hourly wage ($4.40)
    B. Standard (5.75 per hour, 23 per day)
    C. Incentive concept
    D. Chart (change chart for each group)
        1. Possible production rate
        2. Percent of standard
        3. Wage
        4. Incentive pay
        5. Daily earnings
    E. Formula
    F. Questions?

VI. Note on efficiency report (groups 1-5)

VII. Instruction for groups 6 and 7

    A. Explanation of standard, no incentive
    B. No explanation of standard or incentive

VIII. Note on efficiency report (groups 6 and 7)

IX. Review of rules of work

    A. Parking
    B. Work hours
    C. Tardy/absent (265-6253)
    D. Food and drink
    E. Breaks
    F. Time cards
    G. Sequence of questions
    H. Corrections
    I. Marks and smudges
    J. Multiple answers
    K. No answers
    L. Completed questionnaires
    M. Talking
    N. Bent answer sheets
    O. Pencils

X. First questionnaires

XI. Explanation of efficiency report (groups 1-5)

    A. ID #
    B. Day
    C. QS COMP: Do not leave partially coded questionnaires
    D. PHRS = actual work time (less training and Navy questions)
    E. Q/HR
    F. % ERR
        1. Double coding
        2. Small number tolerated (2%)

G. % PERF EFF
    1.   100% = standard
    2.   100% + incentive = extra pay
H. THRS = total time less late, absence, early departure
I. Earnings = $4.40 per hour
J. Incentive pay (different for each group)
K. Total pay

INTRODUCTION

Welcome. My name is _____ and I will be your supervisor for this week. As you may know, this is a temporary summer job. The Navy needs to have a large number of these Fleet Experience Questionnaires (hold up example) coded on to a standardized answer sheet (hold up example) so the answers can be machine-scored and analyzed. The SDSU Foundation has contracted with the Navy to complete the coding. You have been hired to do the job. You will not be answering the questions on the questionnaire yourself. The questionnaires have already been filled out by Navy personnel. Your job, if you continue for the rest of the week, will be to transfer the answers in the questionnaire booklet on to this standardized answer sheet. In addition to the coding task, we have consented to allow the Navy to ask you some questions about your job. Some researchers from the Navy who are doing research on employee reactions to a variety of jobs will be here later to do this. While we encourage your cooperation with them in their research, your participation is voluntary and will not affect your employment with us. We will not be receiving any of your answers to the questions they ask.

Roll call.

Housekeeping.

    1.   Time cards and timekeeping
    2.   Parking
    3.   Paychecks: Checks mailed on the 26th (week 1) and August 9 (week 2)
    4.   Dismiss low scorers and late registrants, friends, etc.

Assign employee numbers.

TRAINING AND PRACTICE SESSION

We need to do a number of things today before you actually begin your job. First, we would like to train you for the work and give you some time to practice and ask questions. After you have gained some proficiency with the job we will be conducting what we call a "work sample." We will ask you to perform the job for a period of time. How well you do will determine whether you will be hired on for the rest of the week or be let go. If your performance shows that you would have difficulty with this task, or if you decide that you don't want to continue, you will be paid for your four hours today and be excused from additional work. So, please do your best during the training and work sample session; we would like to retain all of you. Remember, you are not taking a test, you are coding the answers others have given on these questionnaires.

Training

It is very important that the task you will be asked to perform be done neatly, accurately, and quickly. Sloppy coding can't be read by the computer or will be recorded as an error and slow work is expensive.

The Fleet Experiences Questionnaire is a set of questions which are asked of all first-term Navy personnel in an effort to determine the attitudes of Navy personnel toward their fleet experiences. Open your sample questionnaire to the first page (sample questionnaire, answer sheets, and pencils should be provided at this time or in advance). There are 190 questions which are organized into eight parts. Parts I and II are on the first page and the information from these questions will be coded on side two (the back) of your answer sheet. Please turn your answer sheet over to side two. Now turn your answer sheet so it is facing this way (show example on poster or overhead transparency).

The first thing you want to do is enter the day and your identification number in the space labeled "Identification Number" in the lower left hand box (point to box). Write in the work day (day 1, 2, 3, etc.) in the first space and ID number in the next three spaces at the top (point to area). Then fill in the bubbles which correspond to these numbers. This information should be entered with a black lead pencil (#2½ or softer). Please use the pencil that we provide and under no circumstances should you use ink or felt tip pens. Be sure the bubbles are filled in completely (refer to example on side one). This number is your employee identification number for the rest of this week. Please use this number on all of your work and please sit at this work station every day you are here to make my job of keeping track of work hours and job performance manageable.

The next thing you want to do is code the information from question #2 on the questionnaire booklet. You will not be coding questions 1 and 3, but the six numbers in question 2 must be recorded on the answer sheet. These six numbers will go in the area labeled "special codes" just to the left of your ID number and just below where it says "sex" (point to area). Again, write the numbers in the blank spaces at the top and fill in the bubbles which correspond to these six numbers.

Now it is time to learn to code the information for questions 4-15 in Part II. This information goes in the box in the upper left hand portion of the answer sheet (side two). In the blank spaces labeled "name" you must write in the numbers 4-15, one number in each box (show how this is done on a transparency or poster). Now, for each question you want to fill in the bubble which corresponds to the answer given for that question. For example, if on question #4 the person put "C" as an answer, then fill in the bubble labeled "C." Do the same for the rest of the questions up to question #15.

The rest of the questions (16-190) for parts III through XIII are to be coded on the rest of the answer sheet. Turn your answer sheet over to side one and face it this way (show how answer sheet is placed). Begin question #16 on line #16 of the answer sheet (point to line #16). For questions #16-190 the person answering the questionnaire will be making one of five choices (A, B, C, D, or E). You must fill in the correct bubbles for each question. Remember, it is important that you be neat and not make any errors. The following rules should be followed to ensure that the answer sheets are completed properly:

1. Be careful not to answer questions out of sequence. It is easy to get off by one or two questions if you are not careful. Be sure to begin on line #16 when filling out Parts III-XIII (page 2 on). Please note that the columns on the answer sheet

are not numbered consecutively all the way down to the bottom of the sheet. The numbers go half way down the sheet and then continue on the next column. For example, line 16 begins in the middle of the second column and line 20 is the last line in that column. Line 21 then begins at the top of the column three. The first 60 lines are located in the top portion of the answer sheet and, likewise, lines 61-120 are located on the bottom portion. The same situation exists on the side two of the answer sheet, with lines 121-180 on the top portion and 181-240 on the bottom portion.

2. If you make an error, please erase your mistake thoroughly before entering your correction.

3. Avoid stray marks and smudges on your answer sheet.

4. Under no circumstances should you have more than one answer for any given question. If your questionnaire has more than one response for a question or you can't figure out the answer, then you should leave the question blank.

5. If the questionnaire has no answer to a given question, please leave the question blank.

To help streamline the work, we have established the following procedures:

1. You will be provided with a stack of questionnaire booklets and answer sheets. If you run low, I will bring you more so you will not have to move from your work station.

2. You will be provided with several pencils at your work station. If the lead breaks you will have another pencil available so you can continue working.

3. After you have completed a questionnaire, please place the answer sheet inside the questionnaire booklet and set the completed work in front of you. I will collect the completed work from time to time.

4. If you want to talk to your coworkers, please talk quietly so you do not disturb the others who are still working.

5. Feel free to take a break at any time if you need to stand up, stretch your legs, get some refreshments, or go to the restroom.

6. Please be careful not to bend the answer sheets--they are machine-read.

Are there any questions?

Practice

Now, I would like to give you an opportunity to practice the task before we actually have you perform a work sample. Take a few minutes to read through the questions in the questionnaire booklet so you will have an idea of the kinds of questions asked. After you have looked through the booklet, please begin coding the questions. I will go from station to station to observe how your are doing. If you have questions during this practice session, please raise your hand and I will come to your station.

Ready? You can begin.

(Give three questionnaires for practice.)

Are there any questions?

WORK SAMPLE

If everyone has had a chance to complete 3 questionnaires for practice and if there are no further questions, we will now perform the work sample. (Collect practice questionnaire answer sheets.) Please work as quickly as you can while at the same time doing a neat job and avoiding errors. (Check to make sure that there are no blanks on the questionnaires used.)

You will work for ten minutes on the same questionnaires you have been practicing on and at the end of that time I will collect your completed work and will evaluate your work for neatness, accuracy, and speed. After I have completed the evaluation of your work, I will announce the names of those individuals who will be asked to continue for the remainder of the week.

(After ten minutes collect the work sample, evaluate each, and announce that everyone will be retained unless some fail to reach bubble #142.)

REVIEW OF RULES OF WORK

Let us take a few minutes to review the rules which have been established to make this job run more smoothly.

1. Parking.

2. Work hours are from _____ to _____. Please be here promptly each day you are scheduled to work.

3. If you are going to be late or cannot come to work, please call the SDSU Foundation at 265-6253 as soon as you can to let us know. If you come late, your pay will reflect your actual time on the job.

4. No food or drink should be consumed at your work station.

5. You may take a break from your work any time to go to the restroom, relax, get a snack, etc. We ask that you do not abuse the privilege.

6. Time cards.

7. Be careful not to code the questions out of sequence.

8. Erase any errors completely before making corrections.

9. Avoid stray marks and smudges on answer sheets.

10. Do not code more than one answer for any question on the answer sheet.

11. Leave question blank if there is no answer given on the questionnaire.

12. Place the answer sheet inside the completed questionnaire and place both in front of you.

13. If you talk at your work station, talk softly so as not to disturb others.

14. Do not bend answer sheets.

15. Please use the pencils we provide.

ADMINISTRATION OF FIRST QUESTIONNAIRE

Before we actually begin the job of coding the Fleet Experience Questionnaires, some folks from the Navy want to ask a few questions about yourself and your opinions about work. The Navy is interested in this information because they want to compare people's responses from different work situations and want to know how to improve work and working conditions. A researcher from the Navy is here today to collect this information. We at the Foundation will not see this information.

(Note that participation will not penalize them in the amount of incentive they can earn. In fact it may help them.)

EXPLANATION OF INCENTIVE SYSTEM GROUP ___

When you signed up for this work you were told that you would be paid $4.40 per hour. You will receive this wage regardless of how many questionnaires you complete per hour. However, since the Foundation is concerned with accomplishing this task as quickly as possible, a wage incentive system has been developed to reward people who do a good job. We have been authorized to set up different payment systems to see which method works best. You have been assigned to this group on a random basis. For your job the average worker performing under normal conditions should be able to code about 5.75 questionnaires per hour (23 per day). As an incentive to do a better job, we will pay you extra for each additional questionnaire that you complete above this standard rate. Here is how the system works.

The chart gives some examples of how you can earn extra money by working above the standard rate.

1. The first column gives some examples of possible production rates, i.e., questionnaires per hour. In the first instance (5.75) the rate is right at standard. The others range from slightly above standard to well above standard.

2. The second column indicates the exact percent of the standard rate for each of the numbers in the first column. For example, the figure 5.75 is 100 percent of standard, the figure 6 is about 104 percent of standard, and the figure 12 is over 200 percent of standard.

3. The third column simply shows your daily pay for four hours at $4.40 per hour.

4. The fourth column shows the incentive pay (extra pay) you will receive if you work above standard. For example, if you code six questionnaires per hour on a particular day you will receive an additional _____ at the end of the day. If you work even harder and code 12 questionnaires per hour then you will receive an extra _____ for the day.

5. The last column shows how much you can earn each day by adding your daily pay to your incentive pay and in parentheses the equivalent hourly pay. (Point out examples. The rate applies to the day achieved only.)

If you would like to keep track of your incentive pay, you can use this formula (point to formula on blackboard) to compute your earnings. (The formula will differ for each incentive condition.)

Are there any questions?

NOTE ON EFFICIENCY REPORT

At the end of each day I will collect your completed work and deliver it to a computer. The computer will count the answer sheets and compare the answers on your sheet with the answers of another person who has also coded the questionnaire. This will allow us to verify the answers and compute an error rate. An "efficiency report" will then be printed out to show you how you are doing and will be given to you the next day. (Provide explanation with first report on Tuesday.)

EXPLANATION OF EFFICIENCY REPORT (GROUPS 1-5)

Here is the report I mentioned yesterday. Each of you is identified by your employee identification number which appears in the column marked "ID #."

1. The next column ("Day") shows the work day for the report. Today (Tuesday) you have a report which has information on how you performed yesterday (Monday). On Wednesday you will receive the report for today and so on.

2. The next column to the right ("QS COMP") will show you how many questionnaires you completed the previous days you worked. You will only get credit for completed questionnaires, so do not leave questionnaire partially coded at the end of the day.

3. The next column ("PHRS") shows you how many "production hours" you worked that day. These are the hours you were actually assigned to be working on coding questionnaires. Time spent answering questions for the Navy and training time will not be counted as production hours.

4. The column labeled "Q/HR" refers to the number of questionnaires you completed per production hour. This column is the number of questionnaires completed per day (column "QS COMP") divided by the production hours (column "PHRS"). The standard rate is 5.75 Q/HR and you will receive extra pay if you work at a higher rate.

5. The "% ERR" column tells you how many errors were made on that day. The Navy is very concerned about errors and so we have developed a system for detecting errors. Each questionnaire booklet will be coded twice, once by you and again by someone else. Whenever the computer finds a discrepancy between two questions it records an error. The % ERR column is the percentage of questions which do not agree between the two codings. A small number of errors can be tolerated, but we want you to keep your error rate at no more than 2 percent. If there are too many errors then I will check your work more closely and correct the situation.

6. The column labeled "% PERF EFF" tells you how well you are doing compared to the standard rate of performance. If you are able to do 5.75 per hour then you are working at the standard rate and you are 100 percent efficient (refer to example). If you work at a rate faster than 5.75 questionnaires per hour, then you are doing better than the standard and are over 100 percent efficient (refer to example). If your are more than 100 percent efficient then you will be rewarded by receiving extra pay.

7. The next column ("THRS") refers to the total time actually on the job. Late time, early departures, and absences will be subtracted from the total hours.

8. The "EARNINGS" column refers to the amount you earn at $4.40 per hour for four hours per day.

9. The "INCENTIVE PAY" column shows the amount you will earn if you work faster than the standard rate. This money is added to your earnings and will increase your total pay.

10. The "TOTAL PAY" column is simply your earnings plus your incentive pay for that day.

Are there any questions?

ALTERNATIVE INSTRUCTIONS FOR NONINCENTIVE GROUPS (GROUPS 6 AND 7)

Group 6: Feedback on Standard, No Incentive

When you signed up for this work you were told that you would be paid $4.40 per hour. You will receive this wage regardless of how many questionnaires you complete per hour. We have been authorized to set up different payment systems to see which method works best. For your job the average worker performing under normal conditions should be able to code about 5.75 questionnaires per hour (23 per day).

Group 7: Feedback on Performance, No Standard or Incentive

When you signed up for this work you were told that you would be paid $4.40 per hour. You will receive this wage regardless of how many questionnaires you complete per hour. We have been authorized to set up different payment systems to see which method works best. You have been assigned to this group on a random basis.

Note on Efficiency Report (Give to Both Groups 6 and 7)

At the end of each day I will collect your completed work and deliver it to a computer. The computer will count the answer sheets and compare the answers on your sheet with the answers of another person who has also coded the questionnaire. This will allow us to verify the answers and compute an error rate. An "efficiency report" will then be printed out to show you how you are doing and will be given to you the next day. (Provide explanation with first report on Tuesday.)

APPENDIX C

RESEARCH INSTRUMENT

1. Introduction

The Navy Personnel Research and Development Center (NAVPERSRANDCEN) is conducting research on personal opinions and preferences of workers in different work situations. As contractors for the S.D.S.U. Foundation, we are interested in how you view your job.

2. Privacy Act Statement

The information obtained in this study will help us to understand how to improve jobs. Your individual comments will be kept in strict confidence by NAVPERSRANDCEN and will not be reported to anyone except in the form of grouped statistical summaries which maintain your individual anonymity. We are requesting your identity through your employee number only to allow us to make comparisons between responses at different times. Your participation in this study is voluntary and if you decide not to participate it will not be held against you. You are encouraged to participate, however, because we feel that the study will be more accurate and have greater impact upon improving work if more people participate.

Please do not skip any items. If you have any questions please feel free to ask.

Thank you for your help.

DELBERT NEBEKER   JAMES A. RIEDEL

CONFIDENTIAL

Employee Number: _____

Attractiveness of Job Factor

People differ in how attracted they are to different things about their jobs. For example, some people feel pleasant working conditions are very important and therefore working at a pleasant place is very _attractive_ to them. For others working in a pleasant place means little or nothing, so good working conditions are neither attractive nor unattractive.

We would like to know how attractive you would find different things about your job. On the next few pages, we describe some of these things. After every description we ask you to describe how attractive you feel the item described is to you. See the example below.

EXAMPLE:

Attractiveness Rating

	Very Unattractive −10	Somewhat Unattractive −5	Neither Attractive Nor Unattractive 0	Somewhat Attractive 5	Very Attractive 10

How attractive is it to you to get a small pay raise . . . . −10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 +1 +2 (+3) +4 +5 +6 +7 +8 +9 +10

How attractive is it to you to get a large pay raise . . . . −10 −9 −9 −7 −6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 (+10)

Note the person in this example feels a "small pay raise" is attractive to a small degree but not as attractive as what he or she would call "somewhat attractive." On the other hand, the person feels "a large pay raise" is very attractive.

Please turn the page and complete all ratings by circling what you feel best describes your feelings.

Circle the appropriate number for each item listed below.

1. Informal Supervisor Recognition: Having your supervisor tell you how he feels about your work. This can be praise for a good job such as a simple "pat on the back" or simply saying "good job." It also might be criticism for a bad job.

	Very Unattractive -10	Somewhat Unattractive -5	Neither Attractive Nor Unattractive 0	Somewhat Attractive +5	Very Attractive +10

How attractive is it to you to get:

Quite a bit of criticism from your
supervisor . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Some criticism from your supervisor. . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Neither criticism nor praise from
your supervisor. . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Some praise from your supervisor . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

A very high amount of praise from
your supervisor . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

2. Sense of Accomplishment: The feeling of self satisfaction you get from having done a good job. This can be a positive feeling when you have done well or a negative feeling of disappointment if you know you've done a poor job.

	Very Unattractive -10	Somewhat Unattractive -5	Neither Attractive Nor Unattractive 0	Somewhat Attractive +5	Very Attractive +10

How attractive is it to you to feel:

Quite a bit of disappointment with
your performance . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Some disappointment with your
performance . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Neither disappointment nor a sense of
accomplishment for your performance. . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Some sense of accomplishment for your
performance. . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

A strong sense of accomplishment for
your performance . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Circle the appropriate number for each item listed below.

3. Your Pay: The amount of money you get paid for your work.

	Very Unattractive	Somewhat Unattractive	Neither Attractive Nor Unattractive	Somewhat Attractive	Very Attractive
How attractive is it to you to get:	-10	-5	0	+5	+10

Paid $4.40 per hour . . . .-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Paid $5.40 per hour . . . .-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Paid $6.40 per hour . . . .-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Paid $7.40 per hour . . . .-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Paid $8.40 per hour . . . .-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Paid $9.40 per hour . . . .-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

4. <u>Friendship and admiration from co-workers</u>: The extent to which your co-workers are friendly and admire you.

	Very Unattractive	Somewhat Unattractive	Neither Attractive Nor Unattractive	Somewhat Attractive	Very Attractive
How attractive to you is it to have:	-10	-5	0	+5	+10

Co-workers who resent you and are very
unfriendly. . . . .-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Co-workers who dislike you and are some-
what unfriendly . . . .-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Co-workers who are neither friendly nor
unfriendly . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Co-workers who like you and are somewhat
friendly . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Co-workers who admire you greatly and are
very friendly. . . . . -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Circle the appropriate number for each item listed below.

5. <u>All job Factors</u>: Comparing some of the levels for the job factors together

How attractive would it be to you to:	Very Unattractive -10	Somewhat Unattractive -5	Neither Attractive Nor Unattractive 0	Somewhat Attractive +5	Very Attractive +10
Get paid $9.40 per hour.	-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10				
Have co-workers who admire you greatly and are very friendly.	-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10				
Get a very high amount of praise from your supervisor	-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10				
Feel a strong sense of accomplishment for your performance	-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10				

Consequences of Work

Different things can happen as a result of how we do our jobs. In the next set of questions we are interested in what you feel are the consequences of doing different amounts of work.

For each of the performance levels listed (that is, completing a certain number of questionnaires per hour), indicate which one of the outcomes (A, B, C, etc.) you believe is most likely to happen to you. That is, in a given set of boxes you would make one check in each row, checking the outcome you think is most likely to happen.

Example: If I completed on the average. . .   at the end of the day, I would. . .

	Feel Very Tired	Feel Somewhat Tired	Feel Neither Tired nor Fresh	Feel Somewhat Fresh	Feel Very Fresh
3 or less					✓
4 per hour					✓
5 per hour				✓	
6 per hour				✓	
7 per hour			✓		
8 per hour			✓		
9 per hour		✓			
10 per hour		✓			
11 or more per hour	✓				

In this example the first row says: "If I completed 3 or less questionnaires per hour at the end of the day I would feel very fresh." That is, completing 3 questionnaires per hour would leave the individual very fresh at the end of the day. Between 4 and 5 he/she would be somewhat fresh. At 6 or 7 he/she is neither tired nor fresh. Above 10 per hour all levels would be very tiring. Note: Every row is to be checked.

Please turn page and complete each of the following Tables being sure to check each row.

Please make <u>one</u> check in each row of the following table.

1. Amount of criticism or praise received from supervisor for performing at the level indicated.

    If I completed on the average. . .   I would receive. . .

	Quite a bit of Criticism	Some Criticism	Neither Praise nor Criticism	Some Praise	A Very High Amount of Praise
3 or less per hour					
4 per hour					
5 per hour					
6 per hour					
7 per hour					
8 per hour					
9 per hour					
10 per hour					
11 or more per hour					

Please make <u>one</u> check in each row of the following table.

2. Feeling you get from performing at the level indicated.

   If I completed on the average . . .   I would feel . . .

	Quite a bit of Disappointment	Some Disappointment	Neither Disappointment nor a sense of Accomplishment	Some sense of Accomplishment	A Strong Sense of Accomplishment
3 or less per hour					
4 per hour					
5 per hour					
6 per hour					
7 per hour					
8 per hour					
9 per hour					
10 per hour					
11 or more per hour					

Please make <u>one</u> check in each row of the following table.

3. The degree to which your co-workers are friendly and admire you if you performed at the levels indicated.

If I completed on the average. . .   My co-workers would. . .

	Resent me and be very Unfriendly	Dislike me and be somewhat Unfriendly	Be Neither Friendly nor Unfriendly	Like me and be Somewhat Friendly	Admire me greatly and be very friendly
3 or less per hour					
4 per hour					
5 per hour					
6 per hour					
7 per hour					
8 per hour					
9 per hour					
10 per hour					
11 or more per hour					

4. For each of the production rates listed below please give what you
    expect your pay would be if you performed at that rate.

Production Rate	Expected pay per hour
If I completed:	I would earn:
3 questionnaires per hour or less	$_____
4 questionnaires per hour	$_____
5 questionnaires per hour	$_____
6 questionnaires per hour	$_____
7 questionnaires per hour	$_____
8 questionnaires per hour	$_____
9 questionnaires per hour	$_____
10 questionnaires per hour	$_____
11 questionnaires per hour or more	$_____

No one can operate at their fastest pace all the time, nor do we operate
at the same pace continually. We speed up or slow down because of things
like energy and fatigue, interest and boredom, problems or delays, etc.
During a regular work day we may go at our fastest pace for a while and at
other times we slow down and even stop for a break once in a while.

The next questions concern your estimate of what your production rate
would be if using present methods you worked at different paces continually.

1. How many questionnaires per hour could you average if you worked at your
slowest work pace continually? _____Questionaires per hour.

2. How many questionnaires per hour could you average if you worked at your
normal work pace continually? _____Questionnaires per hour.

3. How many questionnaires per hour could you average if you worked at your
fastest work pace? _____Questionnaires per hour.

Sometimes people set goals for themselves when they work on a job. For example, some people try for a certain production rate, others try to maintain a certain level of quality, and others try to put in a certain amount of effort. The following questions ask about the goals or objectives you may set. Circle the appropriate answer.

Sometimes people at work set goals or objectives about their <u>production rate</u> on the job.

1. For this job to what extent have you given thought to setting a goal for your own production rate?

    a. To a very great extent

    b. To a great extent

    c. To some extent

    d. To a small extent

    e. Not at all

2. How many questionnaires per hour would you like to complete? (Pick one of the following options as your answer. Be sure to fill in the appropriate number(s) if you pick (a) or (b).)

    a. My goal is to code _____ questionnaires per hour.
                  (fill in number)

    b. My goal is to code between _____ and _____ questionnaires per hour. (fill in number) (fill in number)

    c. My goal is to be the <u>fastest</u> worker.

    d. My goal is to work <u>faster</u> than the average worker.

    e. My goal is to work <u>as fast</u> as the average worker.

    f. My goal is to work <u>slightly faster</u> than the slowest worker.

    g. My only goal is to do as many questionnaires per hour as I can.

    h. Other: My goal is _____

_____.

Sometimes people at work set goals or objectives about the quality of their performance on the job.

3. For this job to what extent have you given thought to setting a goal for your own error rate?

    a. To a very great extent

    b. To a great extent

    c. To some extent

    d. To a small extent

    e. Not at all

4. What error rate per shift would you like to achieve? (Pick one of the following options as your answer. Be sure to fill in the appropriate percentage if you pick (a) or (b)).

    a. My goal is to have an error rate of _____% per day.
                            (Fill in percentage)

    b. My goal is to have an error rate between _____% and
                                   (Fill in percentage)

    _____% per day.
    (Fill in percentage)

    c. My goal is to have the fewest errors of all workers.

    d. My goal is to have fewer errors than the average worker.

    e. My goal is to have an average number of errors.

    f. My goal is to have fewer errors than the worst worker.

    g. My only goal is to make as few errors as I can.

    h. Other: My goal is_____

    _____.

Sometimes people at work set goals or objectives about how hard or at what pace to work on their job.

5. For this job to what extent have you given thought to setting a goal about how hard to work.

   a. To a very great extent

   b. To a great extent

   c. To some extent

   d. To a small extent

   e. Not at all

6. How hard would you like to work? (Pick one of the following options as your answer)

   a. My goal is to continually work as hard as I possibly can, regardless of what others do.

   b. My goal is to work moderately hard regardless of what others do.

   c. My goal is to work hard enough to maintain my average pace regardless of what others do.

   d. My goal is to work at a comfortable relaxed pace for me regardless of what others do.

   e. My goal is to work harder than any other worker.

   f. My goal is to work harder than the average worker.

   g. My goal is to work as hard as the average worker.

   h. My goal is to work harder than the laziest worker.

   i. My only goal is to work as hard as I can.

   j. Other: My goal is _____
      _____.

The following question concerns your willingness or determination to reach the goals that you set for yourself in the last group of questions. People differ on how committed or determined they are to reach their goals. Answer the following questions by circling the number which is most appropriate for you.

1. Committment to a goal means acceptance of it as your own personal goal and determination to reach it. How committed are you to reaching your goal for: (answer for each item below)

	Not at all committed	Slightly Committed	Moderately Committed	Very Committed	Extremely Committed
Production rate	1	2	3	4	5
Error rate	1	2	3	4	5
How hard you would like to work	1	2	3	4	5

2. To what extent are you motivated to reach the goal you set for:

	To a Very Great Extent	To a Great Extent	To some Extent	To a small Extent	Not at All
Production rate	1	2	3	4	5
Error rate	1	2	3	4	5
How hard you would like to work	1	2	3	4	5

3. How satisfied would you be if you reached your goal for:

	Very Satisfied	Satisfied	Neither Satisfied or Dissatisfied	Dissatisfied	Very Dissatisfied
Production Rate	1	2	3	4	5
Error Rate	1	2	3	4	5
How hard you would like to work	1	2	3	4	5

4. How satisfied would you be if you performed somewhat poorer than the goal you set for:

	Very Satisfied	Satisfied	Neither Satisfied or Dissatisfied	Dissatisfied	Very Dissatisfied
Production Rate	1	2	3	4	5
Error Rate	1	2	3	4	5
How hard you would like to work	1	2	3	4	5

5. How satisfied would you be if you performed somewhat better than the goal you set for:

	Very Satisfied	Satisfied	Neither Satisfied or Dissatisfied	Dissatisfied	Very Dissatisfied
Production Rate	1	2	3	4	5
Error Rate	1	2	3	4	5
How hard you would like to work	1	2	3	4	5

Work Performance Estimates

    The questions below ask you to estimate your current work performance.
Answer the questions by giving your best guess as to how you are actually
performing on the job.

1. What would you say is the actual average number of questionnaires you
are finishing per hour?

        _____questionnaires per hour

2. What would you say is your average error rate?

        _____% error

3. What would you say is the work pace you are averaging on the job? (circle
the number you feel is the best estimate)

My slowest   About half my fastest   My fastest
possible pace   possible pace   possible pace

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Job Interest Questions

People differ in how much satisfaction they get from their job. For each statement circle the answer which best describes how much you agree with each statement.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
1. I feel a sense of personal accomplishment when I do this job well.	1	2	3	4	5
2. My opinion of myself goes down when I do this job badly.	1	2	3	4	5
3. I take pride in doing this job as well as I can.	1	2	3	4	5
4. I feel unhappy when my work does not meet my personal standards.	1	2	3	4	5
5. I like to look back on the day's work with a sense of a job well done.	1	2	3	4	5
6. I try to think of ways to do my job more effectively.	1	2	3	4	5

Job Characteristics Questions

Below you will find several job features which some jobs may have. For each job feature, please choose the statement which best describes how much each feature is present in this job.

	None of It	Little of It	Moderate Amount of It	A Lot of It	A Great Deal of It
1. The freedom to choose your own method of work	1	2	3	4	5
2. The amount of responsibility you are given	1	2	3	4	5
3. The recognition you get for good work	1	2	3	4	5
4. Being able to judge your performance while actually doing the job	1	2	3	4	5
5. Your opportunity to use your abilities	1	2	3	4	5
6. The amount of variety in your job	1	2	3	4	5
7. The feeling of doing something important and worthwhile	1	2	3	4	5
8. Doing a whole and complete piece of work	1	2	3	4	5

Work Strategy Questions

The following questions ask about how you perform your work from day to day. Please circle the choices which best describe how you do your job.

1. Do you hold your pencil in your

   a. right hand

   b. left hand

   c. alternated between both

2. When you move back and forth between the questionnaire and the answer sheet, do you usually code

   a. one question at a time

   b. several questions at a time

   If you coded several questions at a time, how many do you usually group together?

   a. one

   b. two

   c. three

   d. four

   e. five or more (how many?_____)

3. Comment on anything you think might be unusual about the method you used to code the questionnaires (e.g., how you hold your pencil). If you can not think of anything leave this question blank.

   _____

   _____

   _____

4. Do you take rest pauses while you work? A <u>rest pause</u> is not working on a questionnaire but remaining at your work station.

   a. never

   b. seldom

   c. sometimes

   d. frequently

   If you take rest pauses answer the following:

5. Approximately how long are the rest pauses?

   a. 1-10 seconds

   b. 10-20 seconds

   c. 20-30 seconds

   d. 30-40 seconds

   e. over 40 seconds (how long?_____)

6. How frequently do they occur?

   a. 1-10 times per day

   b. 10-20 times per day

   c. 20-30 times per day

   d. 30-40 times per day

   e. over 40 times per day   (How Often?_____)

7. Do the rest pauses occur

   a. between questionnaires

   b. while working on a questionnaire

   c. both?

   If you take rest pauses between questionnaires, how many questionnaires do you usually complete before you take a rest pause?

   a. 1-5

   b. 5-10

   c. 10-15

   d. 15-20

   e. over 20   (how many?_____)

8. Do you talk to your coworkers while you are taking rest pauses?

   a. never

   b. seldom

   c. sometimes

   d. frequently

   If you talk to your coworkers during any of your rest pauses answer the following:

9. About what percentage of the talk is related to the job? (circle one)

   a. 10%

   b. 20%

   c. 30%

   d. 40%

   e. 50%

   f. 60%

   g. 70%

   h. 80%

   i. 90%

   j. 100%

10. What is the most talked about job-related topic? (circle only one)

   a. pay

   b. stress

   c. coding task

   d. other _____ (specify)

   A work break is getting up from your work station.

11. Do you take work breaks?

   a. never

   b. seldom

   c. sometimes

   d. frequently

   If you take work breaks, answer the following:

12. How many work breaks do you take per day?

   a. 1-5

   b. 5-10

   c. 10-15

   d. 15-20

   e. more than 20 (how many?_____)

13. Approximately how long is an average work break?

   a. 1-3 minutes

   b. 4-6 minutes

   c. 7-9 minutes

   d. 10-12 minutes

   e. over 12 minutes (how long?_____)

14. Work breaks are   (circle one)

   a. evenly spaced

   b. occur at odd times during the day

15. What is the most important reason for taking most work breaks?

   a. move around

   b. washroom

   c. snack

   d. coffee

   e. soda

   f. smoke

   g. other _____ (specify) (circle one)

16. Do you talk to coworkers during work breaks (time away from work station)?

    a. never

    b. seldom

    c. sometimes

    d. frequently

    If you talk to coworkers during work breaks:

17. About what percent of the talk is related to the job: (circle one)

    a. 10%

    b. 20%

    c. 30%

    d. 40%

    e. 50%

    f. 60%

    g. 70%

    h. 80%

    i. 90%

    j. 100%

18. What is the most talked about job-related topic? (circle one)

    a. pay

    b. stress

    c. coding task

    d. other _____(specify)

19. Which coworker do you talk to most frequently? (circle one)

    a. person working near you

    b. friend

    c. relative (what relation _____)

    d. other _____(specify)

20. Do you talk to coworkers while you are actually coding questionnaires?

    a. never

    b. seldom

    c. sometimes

    d. frequently

If you talk to coworkers while coding questionnaires:

21. About what percent of the talk is related to the job: (circle one)

    a. 10%

    b. 20%

    c. 30%

    d. 40%

    e. 50%

    f. 60%

    g. 70%

    h. 80%

    i. 90%

    j. 100%

22. What is the most talked about job related topic?

    a. pay

    b. stress

    c. coding task

    d. other _____(specify)

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